

SEQUENCE LISTING

<110> ESCAICH, SONIA

<120> COMPOSITIONS OF POLYPEPTIDES SPECIFIC TO PATHOGENIC STRAINS AND
THEIR USE AS VACCINES AND IN IMMUNOTHERAPY

<130> 1721-126

<140> 10/594,461

<141> 2007-01-03

<150> PCT/EP05/003972

<151> 2005-03-29

<150> EP 04290818.6

<151> 2004-03-26

<160> 160

<170> PatentIn version 3.3

<210> 1

<211> 163

<212> PRT

<213> Escherichia coli

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Val	Leu	Gln	Arg	Thr	Cys	Asn	Val	Pro	Gly	Asn	Val	Asp	Val	Ser	Leu
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Gly	Asn	Leu	Tyr	Val	Ser	Asp	Phe	Pro	Asn	Ala	Gly	Ser	Gly	Ser	Pro
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Trp	Val	Asn	Phe	Asp	Leu	Ser	Leu	Thr	Gly	Cys	Gln	Asn	Met	Asn	Thr
65					70					75				80	

Val	Arg	Ala	Thr	Phe	Ser	Gly	Thr	Ala	Asp	Gly	Gln	Thr	Tyr	Tyr	Ala
			85					90						95	

Asn	Thr	Gly	Asn	Ala	Gly	Gly	Ile	Lys	Ile	Glu	Ile	Gln	Asp	Arg	Asp
		100						105					110		

Gly	Ser	Asn	Ala	Ser	Tyr	His	Asn	Gly	Met	Phe	Lys	Thr	Leu	Asn	Val
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115		120		125
Gln Asn Asn Asn Ala Thr Phe Asn Leu Lys Ala Arg Ala Val Ser Lys				
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Gly Gln Val Thr Pro Gly Asn Ile Ser Ser Val Ile Thr Val Thr Tyr				
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Thr Tyr Ala				
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Pro Ala Ile Ala Asn Ala Gln Thr Ser Gln Gln Asp Glu Ser Thr Leu				
	20		25	
				30
Val Val Thr Ala Ser Lys Gln Ser Ser Arg Ser Ala Ser Ala Asn Asn				
	35		40	
				45
Val Ser Ser Thr Val Val Ser Ala Pro Glu Leu Ser Asp Ala Gly Val				
	50		55	
				60
Thr Ala Ser Asp Lys Leu Pro Arg Val Leu Pro Gly Leu Asn Ile Glu				
65		70		75
				80
Asn Ser Gly Asn Met Leu Phe Ser Thr Ile Ser Leu Arg Gly Val Ser				
	85		90	
				95
Ser Ala Gln Asp Phe Tyr Asn Pro Ala Val Thr Leu Tyr Val Asp Gly				
	100		105	
				110
Val Pro Gln Leu Ser Thr Asn Thr Ile Gln Ala Leu Thr Asp Val Gln				
	115		120	
				125
Ser Val Glu Leu Leu Arg Gly Pro Gln Gly Thr Leu Tyr Gly Lys Ser				
	130		135	
				140

Ala Gln Gly Gly Ile Ile Asn Ile Val Thr Gln Gln Pro Asp Ser Thr
145 150 155 160

Pro Arg Gly Tyr Ile Glu Gly Gly Val Ser Ser Arg Asp Ser Tyr Arg
165 170 175

Ser Lys Phe Asn Leu Ser Gly Pro Ile Gln Asp Gly Leu Leu Tyr Gly
180 185 190

Ser Val Thr Leu Leu Arg Gln Val Asp Asp Gly Asp Met Ile Asn Pro
195 200 205

Ala Thr Gly Ser Asp Asp Leu Gly Gly Thr Arg Ala Ser Ile Gly Asn
210 215 220

Val Lys Leu Arg Leu Ala Pro Asp Asp Gln Pro Trp Glu Met Gly Phe
225 230 235 240

Ala Ala Ser Arg Glu Cys Thr Arg Ala Thr Gln Asp Ala Tyr Val Gly
245 250 255

Trp Asn Asp Ile Lys Gly Arg Lys Leu Ser Ile Ser Asp Gly Ser Pro
260 265 270

Asp Pro Tyr Met Arg Arg Cys Thr Asp Ser Gln Thr Leu Ser Gly Lys
275 280 285

Tyr Thr Thr Asp Asp Trp Val Phe Asn Leu Ile Ser Ala Trp Gln Gln
290 295 300

Gln His Tyr Ser Arg Thr Phe Pro Ser Gly Ser Leu Ile Val Asn Met
305 310 315 320

Ser Gln Arg Trp Asn Gln Asp Val Gln Glu Leu Arg Ala Ala Thr Leu
325 330 335

Gly Asp Ala Arg Thr Val Asp Met Val Phe Gly Leu Tyr Arg Gln Asn
340 345 350

Thr Arg Glu Lys Leu Asn Ser Ala Tyr Asp Met Pro Thr Met Pro Tyr
355 360 365

Leu Ser Ser Thr Gly Tyr Thr Thr Ala Glu Thr Leu Ala Ala Tyr Ser

370						375						380					
Asp	Leu	Thr	Trp	His	Leu	Thr	Asp	Arg	Phe	Asp	Ile	Gly	Gly	Gly	Val		
385					390					395					400		
Arg	Phe	Ser	His	Asp	Lys	Ser	Ser	Thr	Gln	Tyr	His	Gly	Ser	Met	Leu		
				405					410					415			
Gly	Asn	Pro	Phe	Gly	Asp	Gln	Gly	Lys	Ser	Asn	Asp	Asp	Gln	Val	Leu		
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Gly	Gln	Leu	Ser	Ala	Gly	Tyr	Met	Leu	Thr	Asp	Asp	Trp	Arg	Val	Tyr		
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Thr	Arg	Val	Ala	Gln	Gly	Tyr	Lys	Pro	Ser	Gly	Tyr	Asn	Ile	Val	Pro		
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Thr	Ala	Gly	Leu	Asp	Ala	Lys	Pro	Phe	Val	Ala	Glu	Lys	Ser	Ile	Asn		
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Tyr	Glu	Leu	Gly	Thr	Arg	Tyr	Glu	Thr	Ala	Asp	Val	Thr	Leu	Gln	Ala		
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Ala	Thr	Phe	Tyr	Thr	His	Thr	Lys	Asp	Met	Gln	Leu	Tyr	Ser	Gly	Pro		
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Val	Gly	Met	Gln	Thr	Leu	Ser	Asn	Ala	Gly	Lys	Ala	Asp	Ala	Thr	Gly		
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Val	Glu	Leu	Glu	Ala	Lys	Trp	Arg	Phe	Ala	Pro	Gly	Trp	Ser	Trp	Asp		
	530					535					540						
Ile	Asn	Gly	Asn	Val	Ile	Arg	Ser	Glu	Phe	Thr	Asn	Asp	Ser	Glu	Leu		
545					550					555					560		
Tyr	His	Gly	Asn	Arg	Val	Pro	Phe	Val	Pro	Arg	Tyr	Gly	Ala	Gly	Ser		
				565					570					575			
Ser	Val	Asn	Gly	Val	Ile	Asp	Thr	Arg	Tyr	Gly	Ala	Leu	Met	Pro	Arg		
			580					585					590				
Leu	Ala	Val	Asn	Leu	Val	Gly	Pro	His	Tyr	Phe	Asp	Gly	Asp	Asn	Gln		
		595					600					605					

Leu Arg Gln Gly Thr Tyr Ala Thr Leu Asp Ser Ser Leu Gly Trp Gln
610 615 620

Ala Thr Glu Arg Met Asn Ile Ser Val Tyr Val Asp Asn Leu Phe Asp
625 630 635 640

Arg Arg Tyr Arg Thr Tyr Gly Tyr Met Asn Gly Ser Ser Ala Val Ala
645 650 655

Gln Val Asn Met Gly Arg Thr Val Gly Ile Asn Thr Arg Ile Asp Phe
660 665 670

Phe

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<213> Escherichia coli

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Ala Val Asn Ala Gly Ala Lys Glu Gly Lys Ser Gly Phe Tyr Leu Thr
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Gly Lys Ala Gly Ala Ser Val Met Ser Leu Ser Asp Gln Arg Phe Leu
35 40 45

Ser Gly Asp Glu Glu Glu Thr Ser Lys Tyr Lys Gly Gly Asp Asp His
50 55 60

Asp Thr Val Phe Ser Gly Gly Ile Ala Val Gly Tyr Asp Phe Tyr Pro
65 70 75 80

Gln Phe Ser Ile Pro Val Arg Thr Glu Leu Glu Phe Tyr Ala Arg Gly
85 90 95

Lys Ala Asp Ser Lys Tyr Asn Val Asp Lys Asp Ser Trp Ser Gly Gly
100 105 110

Tyr Trp Arg Asp Asp Leu Lys Asn Glu Val Ser Val Asn Thr Leu Met

115	120	125
Leu Asn Ala Tyr Tyr Asp Phe Arg Asn Asp Ser Ala Phe Thr Pro Trp		
130	135	140
Val Ser Ala Gly Ile Gly Tyr Ala Arg Ile His Gln Lys Thr Thr Gly		
145	150	155
Ile Ser Thr Trp Asp Tyr Glu Tyr Gly Ser Ser Gly Arg Glu Ser Leu		
165	170	175
Ser Arg Ser Gly Ser Ala Asp Asn Phe Ala Trp Ser Leu Gly Ala Gly		
180	185	190
Val Arg Tyr Asp Val Thr Pro Asp Ile Ala Leu Asp Leu Ser Tyr Arg		
195	200	205
Tyr Leu Asp Ala Gly Asp Ser Ser Val Ser Tyr Lys Asp Glu Trp Gly		
210	215	220
Asp Lys Tyr Lys Ser Glu Val Asp Val Lys Ser His Asp Ile Met Leu		
225	230	235
Gly Met Thr Tyr Asn Phe		
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Ala Phe Ser Ala Gln Ala Val Asp Thr Thr Ile Thr Val Thr Gly Arg
20 25 30
Val Leu Pro Arg Thr Cys Thr Ile Gly Asn Gly Gly Asn Pro Asn Ala
35 40 45
Thr Val Val Leu Asp Asn Ala Tyr Thr Ser Asp Leu Ile Ala Ala Asn
50 55 60

Ser Thr Ser Gln Trp Lys Asn Phe Ser Leu Thr Leu Thr Asn Cys Gln
65 70 75 80

Asn Val Asn Asn Val Thr Ser Phe Gly Gly Thr Ala Glu Asn Thr Asn
85 90 95

Tyr Tyr Arg Asn Thr Gly Asp Ala Thr Asn Ile Met Val Glu Leu Gln
100 105 110

Glu Gln Gly Asn Gly Asn Thr Pro Leu Lys Val Gly Ser Thr Lys Val
115 120 125

Val Thr Val Ser Asn Gly Gln Ala Thr Phe Asn Leu Lys Val Arg Ala
130 135 140

Val Ser Lys Gly Asn Ala Gly Ala Gly Ser Ile Asn Ser Gln Ile Thr
145 150 155 160

Val Thr Tyr Thr Tyr Ala
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Ile Ala Val Ser Glu Leu Ala Lys Arg Val Ser Gly Lys Thr Asn Arg
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Lys Leu Val Ala Thr Met Leu Ser Leu Ala Val Ala Gly Thr Val Asn
35 40 45

Ala Ala Asn Ile Asp Ile Ser Asn Val Trp Ala Arg Asp Tyr Leu Asp
50 55 60

Leu Ala Gln Asn Lys Gly Ile Phe Gln Pro Gly Ala Thr Asp Val Thr
65 70 75 80

Ile Thr Leu Lys Asn Gly Asp Lys Phe Ser Phe His Asn Leu Ser Ile
85 90 95

Pro	Asp	Phe	Ser	Gly	Ala	Ala	Ala	Ser	Gly	Ala	Ala	Thr	Ala	Ile	Gly	
			100					105					110			
Gly	Ser	Tyr	Ser	Val	Thr	Val	Ala	His	Asn	Lys	Lys	Asn	Pro	Gln	Ala	
		115					120					125				
Ala	Glu	Thr	Gln	Val	Tyr	Ala	Gln	Ser	Ser	Tyr	Arg	Val	Val	Asp	Arg	
	130					135					140					
Arg	Asn	Ser	Asn	Asp	Phe	Glu	Ile	Gln	Arg	Leu	Asn	Lys	Phe	Val	Val	
145					150					155					160	
Glu	Thr	Val	Gly	Ala	Thr	Pro	Ala	Glu	Thr	Asn	Pro	Thr	Thr	Tyr	Ser	
			165						170					175		
Asp	Ala	Leu	Glu	Arg	Tyr	Gly	Ile	Val	Thr	Ser	Asp	Gly	Ser	Lys	Lys	
			180					185					190			
Ile	Ile	Gly	Phe	Arg	Ala	Gly	Ser	Gly	Gly	Thr	Ser	Phe	Ile	Asn	Gly	
		195					200					205				
Glu	Ser	Lys	Ile	Ser	Thr	Asn	Ser	Ala	Tyr	Ser	His	Asp	Leu	Leu	Ser	
	210					215					220					
Ala	Ser	Leu	Phe	Glu	Val	Thr	Gln	Trp	Asp	Ser	Tyr	Gly	Met	Met	Ile	
225					230					235					240	
Tyr	Lys	Asn	Asp	Lys	Thr	Phe	Arg	Asn	Leu	Glu	Ile	Phe	Gly	Asp	Ser	
				245					250					255		
Gly	Ser	Gly	Ala	Tyr	Leu	Tyr	Asp	Asn	Lys	Leu	Glu	Lys	Trp	Val	Leu	
			260					265					270			
Val	Gly	Thr	Thr	His	Gly	Ile	Ala	Ser	Val	Asn	Gly	Asp	Gln	Leu	Thr	
		275					280					285				
Trp	Ile	Thr	Lys	Tyr	Asn	Asp	Lys	Leu	Val	Ser	Glu	Leu	Lys	Asp	Thr	
	290					295					300					
Tyr	Ser	His	Lys	Ile	Asn	Leu	Asn	Gly	Asn	Asn	Val	Thr	Ile	Lys	Asn	
305					310					315					320	

Thr Asp Ile Thr Leu His Gln Asn Asn Ala Asp Thr Thr Gly Thr Gln
325 330 335

Glu Lys Ile Thr Lys Asp Lys Asp Ile Val Phe Thr Asn Gly Gly Asp
340 345 350

Val Leu Phe Lys Asp Asn Leu Asp Phe Gly Ser Gly Gly Ile Ile Phe
355 360 365

Asp Glu Gly His Glu Tyr Asn Ile Asn Gly Gln Gly Phe Thr Phe Lys
370 375 380

Gly Ala Gly Ile Asp Ile Gly Lys Glu Ser Ile Val Asn Trp Asn Ala
385 390 395 400

Leu Tyr Ser Ser Asp Asp Val Leu His Lys Ile Gly Pro Gly Thr Leu
405 410 415

Asn Val Gln Lys Lys Gln Gly Ala Asn Ile Lys Ile Gly Glu Gly Asn
420 425 430

Val Ile Leu Asn Glu Glu Gly Thr Phe Asn Asn Ile Tyr Leu Ala Ser
435 440 445

Gly Asn Gly Lys Val Ile Leu Asn Lys Asp Asn Ser Leu Gly Asn Asp
450 455 460

Gln Tyr Ala Gly Ile Phe Phe Thr Lys Arg Gly Gly Thr Leu Asp Leu
465 470 475 480

Asn Gly His Asn Gln Thr Phe Thr Arg Ile Ala Ala Thr Asp Asp Gly
485 490 495

Thr Thr Ile Thr Asn Ser Asp Thr Thr Lys Glu Ala Val Leu Ala Ile
500 505 510

Asn Asn Glu Asp Ser Tyr Ile Tyr His Gly Asn Ile Asn Gly Asn Ile
515 520 525

Lys Leu Thr His Asn Ile Asn Ser Gln Asp Lys Lys Thr Asn Ala Lys
530 535 540

Leu Ile Leu Asp Gly Ser Val Asn Thr Lys Asn Asp Val Glu Val Ser
545 550 555 560

Asn Ala Ser Leu Thr Met Gln Gly His Ala Thr Glu His Ala Ile Phe
565 570 575

Arg Ser Ser Ala Asn His Cys Ser Leu Val Phe Leu Cys Gly Thr Asp
580 585 590

Trp Val Thr Val Leu Lys Glu Thr Glu Ser Ser Tyr Asn Lys Lys Phe
595 600 605

Asn Ser Asp Tyr Lys Ser Asn Asn Gln Gln Thr Ser Phe Asp Gln Pro
610 615 620

Asp Trp Lys Thr Gly Val Phe Lys Phe Asp Thr Leu His Leu Asn Asn
625 630 635 640

Ala Asp Phe Ser Ile Ser Arg Asn Ala Asn Val Glu Gly Asn Ile Ser
645 650 655

Ala Asn Lys Ser Ala Ile Thr Ile Gly Asp Lys Asn Val Tyr Ile Asp
660 665 670

Asn Leu Ala Gly Lys Asn Ile Thr Asn Asn Gly Phe Asp Phe Lys Gln
675 680 685

Thr Ile Ser Thr Asn Leu Ser Ile Gly Glu Thr Lys Phe Thr Gly Gly
690 695 700

Ile Thr Ala His Asn Ser Gln Ile Ala Ile Gly Asp Gln Ala Val Val
705 710 715 720

Thr Leu Asn Gly Ala Thr Phe Leu Asp Asn Thr Pro Ile Ser Ile Asp
725 730 735

Lys Gly Ala Lys Val Ile Ala Gln Asn Ser Met Phe Thr Thr Lys Gly
740 745 750

Ile Asp Ile Ser Gly Glu Leu Thr Met Met Gly Ile Pro Glu Gln Asn
755 760 765

Ser Lys Thr Val Thr Pro Gly Leu His Tyr Ala Ala Asp Gly Phe Arg

770					775					780					
Leu	Ser	Gly	Gly	Asn	Ala	Asn	Phe	Ile	Ala	Arg	Asn	Met	Ala	Ser	Val
785					790					795					800
Thr	Gly	Asn	Ile	Tyr	Ala	Asp	Asp	Ala	Ala	Thr	Ile	Thr	Leu	Gly	Gln
				805					810					815	
Pro	Glu	Thr	Glu	Thr	Pro	Thr	Ile	Ser	Ser	Ala	Tyr	Gln	Ala	Trp	Ala
			820					825					830		
Glu	Thr	Leu	Leu	Tyr	Gly	Phe	Asp	Thr	Ala	Tyr	Arg	Gly	Ala	Ile	Thr
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Ala	Pro	Lys	Ala	Thr	Val	Ser	Met	Asn	Asn	Ala	Ile	Trp	His	Leu	Asn
	850					855					860				
Ser	Gln	Ser	Ser	Ile	Asn	Arg	Leu	Glu	Thr	Lys	Asp	Ser	Met	Val	Arg
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Phe	Thr	Gly	Asp	Asn	Gly	Lys	Phe	Thr	Thr	Leu	Thr	Val	Asn	Asn	Leu
				885					890					895	
Thr	Ile	Asp	Asp	Ser	Ala	Phe	Val	Leu	Arg	Ala	Asn	Leu	Ala	Gln	Ala
			900					905					910		
Asp	Gln	Leu	Val	Val	Asn	Lys	Ser	Leu	Ser	Gly	Lys	Asn	Asn	Leu	Leu
		915					920					925			
Leu	Val	Asp	Phe	Ile	Glu	Lys	Asn	Gly	Asn	Ser	Asn	Gly	Leu	Asn	Ile
	930					935					940				
Asp	Leu	Val	Ser	Ala	Pro	Lys	Gly	Thr	Ala	Val	Asp	Val	Phe	Lys	Ala
945					950					955					960
Thr	Thr	Arg	Ser	Ile	Gly	Phe	Ser	Asp	Val	Thr	Pro	Val	Ile	Glu	Gln
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Lys	Asn	Asp	Thr	Asp	Lys	Ala	Thr	Trp	Thr	Leu	Ile	Gly	Tyr	Lys	Ser
			980					985					990		
Val	Ala	Asn	Ala	Asp	Ala	Ala	Lys	Lys	Ala	Thr	Leu	Leu	Met	Ser	Gly

995					1000					1005				
Gly	Tyr	Lys	Ala	Phe	Leu	Ala	Glu	Val	Asn	Asn	Leu	Asn	Lys	Arg
1010						1015					1020			
Met	Gly	Asp	Leu	Arg	Asp	Ile	Asn	Gly	Glu	Ser	Gly	Ala	Trp	Ala
1025						1030					1035			
Arg	Ile	Ile	Ser	Gly	Thr	Gly	Ser	Ala	Gly	Gly	Gly	Phe	Ser	Asp
1040						1045					1050			
Asn	Tyr	Thr	His	Val	Gln	Val	Gly	Ala	Asp	Asn	Lys	His	Glu	Leu
1055						1060					1065			
Asp	Gly	Leu	Asp	Leu	Phe	Thr	Gly	Val	Thr	Met	Thr	Tyr	Thr	Asp
1070						1075					1080			
Ser	His	Ala	Gly	Ser	Asp	Ala	Phe	Ser	Gly	Glu	Thr	Lys	Ser	Val
1085						1090					1095			
Gly	Ala	Gly	Leu	Tyr	Ala	Ser	Ala	Met	Phe	Glu	Ser	Gly	Ala	Tyr
1100						1105					1110			
Ile	Asp	Leu	Ile	Gly	Lys	Tyr	Val	His	His	Asp	Asn	Glu	Tyr	Thr
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Ala	Thr	Phe	Ala	Gly	Leu	Gly	Thr	Arg	Asp	Tyr	Ser	Ser	His	Ser
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Trp	Tyr	Ala	Gly	Ala	Glu	Val	Gly	Tyr	Arg	Tyr	His	Val	Thr	Asp
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Ser	Ala	Trp	Ile	Glu	Pro	Gln	Ala	Glu	Leu	Val	Tyr	Gly	Ala	Val
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Ser	Gly	Lys	Gln	Phe	Ser	Trp	Lys	Asp	Gln	Gly	Met	Asn	Leu	Thr
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1190						1195					1200			
Asp	Val	Gly	Lys	Ser	Phe	Ser	Gly	Lys	Asp	Trp	Lys	Val	Thr	Ala

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 Arg Ala Gly Leu Gly Tyr Gln Phe Asp Leu Phe Ala Asn Gly Glu
 1220 1225 1230
 Thr Val Leu Arg Asp Ala Ser Gly Glu Lys Arg Ile Lys Gly Glu
 1235 1240 1245
 Lys Asp Gly Arg Met Leu Met Asn Val Gly Leu Asn Ala Glu Ile
 1250 1255 1260
 Arg Asp Asn Leu Arg Phe Gly Leu Glu Phe Glu Lys Ser Ala Phe
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 Ser Phe
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 Pro Arg Ala His Asn Thr Thr Gly Leu Leu Pro Val Arg Glu Ile Cys
 35 40 45
 Phe Pro His His Gly Asp Asp Gly Arg Asn Ser Ile Glu Pro Ser Ile
 50 55 60
 Ser Arg Ala Ala His Thr Asp Arg Leu Arg Phe Val Cys Met Thr Arg
 65 70 75 80
 Thr Gly Ser Thr Thr Ser Arg Pro Phe Cys Pro Ile Pro Arg Ser Pro
 85 90 95

Ala Leu Asn Ala Ser Gly Gln Gln Asp Ser Gly Phe Trp Gly Val Ser
100 105 110

Ser Ile Pro Gly Asp Ile Leu Met Phe Gln Leu His Val Leu Ile Val
115 120 125

Phe Ile Cys Lys Ile Asn Leu Ser Asp Asn Asn Ile Ser Tyr
130 135 140

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<400> 7

Met Tyr Ala Arg Glu Tyr Arg Ser Thr Arg Pro His Lys Ala Ile Phe
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Phe His Leu Ser Cys Leu Thr Leu Ile Cys Ser Ala Gln Val Tyr Ala
20 25 30

Lys Pro Asp Met Arg Pro Leu Gly Pro Asn Ile Ala Asp Lys Gly Ser
35 40 45

Val Phe Tyr His Phe Ser Ala Thr Ser Phe Asp Ser Val Asp Gly Thr
50 55 60

Arg His Tyr Arg Val Trp Thr Ala Val Pro Asn Thr Thr Ala Pro Ala
65 70 75 80

Ser Gly Tyr Pro Ile Leu Tyr Met Leu Asp Gly Asn Ala Val Met Asp
85 90 95

Arg Leu Asp Asp Glu Leu Leu Lys Gln Leu Ser Glu Lys Thr Pro Pro
100 105 110

Val Ile Val Ala Val Gly Tyr Gln Thr Asn Leu Pro Phe Asp Leu Asn
115 120 125

Ser Arg Ala Tyr Asp Tyr Thr Pro Ala Ala Glu Ser Arg Lys Thr Asp
130 135 140

Leu His Ser Gly Arg Phe Ser Arg Lys Ser Gly Gly Ser Asn Asn Phe
145 150 155 160

Arg Gln Leu Leu Glu Thr Arg Ile Ala Pro Lys Val Glu Gln Gly Leu
165 170 175

Asn Ile Asp Arg Gln Arg Arg Gly Leu Trp Gly His Ser Tyr Gly Gly
180 185 190

Leu Phe Val Leu Asp Ser Trp Leu Ser Ser Ser Tyr Phe Arg Ser Tyr
195 200 205

Tyr Ser Ala Ser Pro Ser Leu Gly Arg Gly Tyr Asp Ala Leu Leu Ser
210 215 220

Arg Val Thr Ala Val Glu Pro Leu Gln Phe Cys Thr Lys His Leu Ala
225 230 235 240

Ile Met Glu Gly Ser Ala Thr Gln Gly Asp Asn Arg Glu Thr His Ala
245 250 255

Val Gly Val Leu Ser Lys Ile His Thr Thr Leu Thr Ile Leu Lys Asp
260 265 270

Lys Gly Val Asn Ala Val Phe Trp Asp Phe Pro Asn Leu Gly His Gly
275 280 285

Pro Met Phe Asn Ala Ser Phe Arg Gln Ala Leu Leu Asp Ile Ser Gly
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Glu Asn Ala Asn Tyr Thr Ala Gly Cys His Glu Leu Ser His
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20 25 30

Glu Thr Leu Val Val Glu Ala Thr Ala Glu Gln Val Leu Lys Gln Gln

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Pro	Gly	Val	Ser	Val	Ile	Thr	Ser	Glu	Asp	Ile	Lys	Lys	Thr	Pro	Pro
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Val	Asn	Asp	Leu	Ser	Asp	Ile	Ile	Arg	Lys	Met	Pro	Gly	Val	Asn	Leu
65					70					75					80
Thr	Gly	Asn	Ser	Ala	Ser	Gly	Thr	Arg	Gly	Asn	Asn	Arg	Gln	Ile	Asp
				85					90					95	
Ile	Arg	Gly	Met	Gly	Pro	Glu	Asn	Thr	Leu	Ile	Leu	Ile	Asp	Gly	Val
			100					105					110		
Pro	Val	Thr	Ser	Arg	Asn	Ser	Val	Arg	Tyr	Ser	Trp	Arg	Gly	Glu	Arg
		115					120					125			
Asp	Thr	Arg	Gly	Asp	Thr	Asn	Trp	Val	Pro	Pro	Glu	Gln	Val	Glu	Arg
	130					135					140				
Ile	Glu	Val	Ile	Arg	Gly	Pro	Ala	Ala	Ala	Arg	Tyr	Gly	Ser	Gly	Ala
145					150					155					160
Ala	Gly	Gly	Val	Val	Asn	Ile	Ile	Thr	Lys	Arg	Pro	Thr	Asn	Asp	Trp
				165					170					175	
His	Gly	Ser	Leu	Ser	Leu	Tyr	Thr	Asn	Gln	Pro	Glu	Ser	Ser	Glu	Glu
			180					185					190		
Gly	Ala	Thr	Arg	Arg	Ala	Asn	Phe	Ser	Leu	Ser	Gly	Pro	Leu	Ala	Gly
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Asp	Ala	Leu	Thr	Thr	Arg	Leu	Tyr	Gly	Asn	Leu	Asn	Lys	Thr	Asp	Ala
	210					215					220				
Asp	Ser	Trp	Asp	Ile	Asn	Ser	Pro	Val	Gly	Thr	Lys	Asn	Ala	Ala	Gly
225					230					235					240
His	Glu	Gly	Val	Arg	Asn	Lys	Asp	Ile	Asn	Gly	Val	Val	Ser	Trp	Lys
				245					250					255	
Leu	Asn	Pro	Gln	Gln	Ile	Leu	Asp	Phe	Glu	Val	Gly	Tyr	Ser	Arg	Gln
			260					265					270		

Gly Asn Ile Tyr Ala Gly Asp Thr Gln Asn Ser Ser Ser Ser Ala Val
275 280 285

Thr Glu Ser Leu Ala Lys Ser Gly Lys Glu Thr Asn Arg Leu Tyr Arg
290 295 300

Gln Asn Tyr Gly Ile Thr His Asn Gly Ile Trp Asp Trp Gly Gln Ser
305 310 315 320

Arg Phe Gly Val Tyr Tyr Glu Lys Thr Asn Asn Thr Arg Met Asn Glu
325 330 335

Gly Leu Ser Gly Gly Gly Glu Gly Arg Ile Leu Ala Gly Glu Lys Phe
340 345 350

Thr Thr Asn Arg Leu Ser Ser Trp Arg Thr Ser Gly Glu Leu Asn Ile
355 360 365

Pro Leu Asn Val Met Val Asp Gln Thr Leu Thr Val Gly Ala Glu Trp
370 375 380

Asn Arg Asp Lys Leu Asp Asp Pro Ser Ser Thr Ser Leu Thr Val Asn
385 390 395 400

Asp Arg Asp Ile Ser Gly Ile Ser Gly Ser Ala Ala Asp Arg Ser Ser
405 410 415

Lys Asn His Ser Gln Ile Ser Ala Leu Tyr Ile Glu Asp Asn Ile Glu
420 425 430

Pro Val Pro Gly Thr Asn Ile Ile Pro Gly Leu Arg Phe Asp Tyr Leu
435 440 445

Ser Asp Ser Gly Gly Asn Phe Ser Pro Ser Leu Asn Leu Ser Gln Glu
450 455 460

Leu Gly Asp Tyr Phe Lys Val Lys Ala Gly Val Ala Arg Thr Phe Lys
465 470 475 480

Ala Pro Asn Leu Tyr Gln Ser Ser Glu Gly Tyr Leu Leu Tyr Ser Lys
485 490 495

Gly Asn Gly Cys Pro Lys Asp Ile Thr Ser Gly Gly Cys Tyr Leu Ile
500 505 510

Gly Asn Lys Asp Leu Asp Pro Glu Ile Ser Val Asn Lys Glu Ile Gly
515 520 525

Leu Glu Phe Thr Trp Glu Asp Tyr His Ala Ser Val Thr Tyr Phe Arg
530 535 540

Asn Asp Tyr Gln Asn Lys Ile Val Ala Gly Asp Asn Val Ile Gly Gln
545 550 555 560

Thr Ala Ser Gly Ala Tyr Ile Leu Lys Trp Gln Asn Gly Gly Lys Ala
565 570 575

Leu Val Asp Gly Ile Glu Ala Ser Met Ser Phe Pro Leu Val Lys Glu
580 585 590

Arg Leu Asn Trp Asn Thr Asn Ala Thr Trp Met Ile Thr Ser Glu Gln
595 600 605

Lys Asp Thr Gly Asn Pro Leu Ser Val Ile Pro Lys Tyr Thr Ile Asn
610 615 620

Asn Ser Leu Asn Trp Thr Ile Thr Gln Ala Phe Ser Ala Ser Phe Asn
625 630 635 640

Trp Thr Leu Tyr Gly Arg Gln Lys Pro Arg Thr His Ala Glu Thr Arg
645 650 655

Ser Glu Asp Thr Gly Gly Leu Ser Gly Lys Glu Leu Gly Ala Tyr Ser
660 665 670

Leu Val Gly Thr Asn Phe Asn Tyr Asp Ile Asn Lys Asn Leu Arg Leu
675 680 685

Asn Val Gly Val Ser Asn Ile Leu Asn Lys Gln Ile Phe Arg Ser Ser
690 695 700

Glu Gly Ala Asn Thr Tyr Asn Glu Pro Gly Arg Ala Tyr Tyr Ala Gly
705 710 715 720

Val Thr Ala Ser Phe
725

<210> 9
<211> 1014
<212> PRT
<213> Escherichia coli

<400> 9
Met Gly Asn Gln Trp Gln Gln Lys Tyr Leu Leu Glu Tyr Asn Glu Leu
1 5 10 15

Val Ser Asn Phe Pro Ser Pro Glu Arg Val Val Ser Asp Tyr Ile Lys
20 25 30

Asn Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Arg Ile Asp Pro Asp
35 40 45

Asn Ala Tyr Phe Ile Cys Phe Ser Gln Asn Arg Ser Asn Ser Arg Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Glu Val Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr Arg Phe Asp Val Phe
85 90 95

Asp Asp Ala Asn Ser Ser Thr Gly Ile Tyr Lys Thr Lys Ser Ala Asp
100 105 110

Val Phe Asn Glu Glu Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

His Phe Leu Gln Lys Cys Asp Phe Ala Gly Val Tyr Gly Lys Thr Leu
130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Leu
165 170 175

Asp Glu Arg Glu Tyr Asn Phe Ser Met Asn Ala Leu Asn Arg Ser Asp

			180					185					190				
Asn	Ile	Ser	Leu	Leu	Phe	Phe	Asp	Ile	Tyr	Gly	Tyr	Tyr	Ala	Ser	Asp		
		195					200					205					
Ile	Phe	Val	Ala	Lys	Asn	Asn	Asp	Lys	Val	Met	Leu	Phe	Ile	Pro	Gly		
		210				215					220						
Ala	Lys	Lys	Pro	Phe	Leu	Phe	Lys	Lys	Asn	Ile	Ala	Asp	Leu	Arg	Leu		
225					230					235							
Thr	Leu	Lys	Glu	Leu	Ile	Lys	Asp	Ser	Asp	Asn	Lys	Gln	Leu	Leu	Ser		
				245					250								
Gln	His	Phe	Ser	Leu	Tyr	Ser	Arg	Gln	Asp	Gly	Val	Ser	Tyr	Ala	Gly		
			260					265					270				
Val	Asn	Ser	Val	Leu	His	Ala	Ile	Glu	Asn	Asp	Gly	Asn	Phe	Asn	Glu		
		275					280					285					
Ser	Tyr	Phe	Leu	Tyr	Ser	Asn	Lys	Thr	Leu	Ser	Asn	Lys	Asp	Val	Phe		
		290				295					300						
Asp	Ala	Ile	Ala	Ile	Ser	Val	Lys	Lys	Arg	Ser	Phe	Ser	Asp	Gly	Asp		
305					310					315							
Ile	Val	Ile	Lys	Ser	Asn	Ser	Glu	Ala	Gln	Arg	Asp	Tyr	Ala	Leu	Thr		
				325					330					335			
Ile	Leu	Gln	Thr	Ile	Leu	Ser	Met	Thr	Pro	Ile	Phe	Asp	Ile	Val	Val		
			340					345					350				
Pro	Glu	Val	Ser	Val	Pro	Leu	Gly	Leu	Gly	Ile	Ile	Thr	Ser	Ser	Met		
		355					360					365					
Gly	Ile	Ser	Phe	Asp	Gln	Leu	Ile	Asn	Gly	Asp	Thr	Tyr	Glu	Glu	Arg		
		370				375					380						
Arg	Ser	Ala	Ile	Pro	Gly	Leu	Ala	Thr	Asn	Ala	Val	Leu	Leu	Gly	Leu		
385					390					395							
Ser	Phe	Ala	Ile	Pro	Leu	Leu	Ile	Ser	Lys	Ala	Gly	Ile	Asn	Gln	Glu		
				405					410					415			

Val Leu Ser Ser Val Ile Asn Asn Glu Gly Arg Thr Leu Asn Glu Thr
420 425 430

Asn Ile Asp Ile Phe Leu Lys Glu Tyr Gly Ile Ala Glu Asp Ser Ile
435 440 445

Ser Ser Thr Asn Leu Leu Asp Val Lys Leu Lys Ser Ser Gly Gln His
450 455 460

Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Gln Ile Val Ala Val
465 470 475 480

Lys Gly Ser Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr
485 490 495

Gly Tyr Glu Ile Leu Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asn
500 505 510

Glu Ile Leu Trp Thr Arg Gly Gly Gly Leu Lys Gly Gly Gln Pro Phe
515 520 525

Asp Phe Glu Ser Leu Asn Ile Pro Val Phe Phe Lys Asp Glu Pro Tyr
530 535 540

Ser Ala Val Thr Gly Ser Pro Leu Ser Phe Ile Asn Asp Asp Ser Ser
545 550 555 560

Leu Leu Tyr Pro Asp Thr Asn Pro Lys Leu Pro Gln Pro Thr Ser Glu
565 570 575

Met Asp Ile Val Asn Tyr Val Lys Gly Ser Gly Ser Phe Gly Asp Arg
580 585 590

Phe Val Thr Leu Met Arg Gly Ala Thr Glu Glu Glu Ala Trp Asn Ile
595 600 605

Ala Ser Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile
610 615 620

Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
625 630 635 640

Ser Asn Val Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val
645 650 655

Val Ile Lys Val His Val Lys Tyr Ile Thr Asn Asn Asn Val Ser Tyr
660 665 670

Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala
675 680 685

Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asp
690 695 700

Ile Ser Thr Ile Arg Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Ser
705 710 715 720

Ile Glu Ser Thr Ser Lys Ser Asn Phe Gln Lys Leu Ser Arg Gly Asn
725 730 735

Ile Asp Val Leu Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg
740 745 750

Ala Ile Tyr Pro Tyr Phe Glu Ala Ala Asn Ala Asp Glu Gln Gln Pro
755 760 765

Leu Phe Phe Tyr Ile Lys Lys Asp Arg Phe Asp Asn His Gly Tyr Asp
770 775 780

Gln Tyr Phe Tyr Asp Asn Thr Val Gly Leu Asn Gly Ile Pro Thr Leu
785 790 795 800

Asn Thr Tyr Thr Gly Glu Ile Pro Ser Asp Ser Ser Ser Leu Gly Ser
805 810 815

Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg
820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
835 840 845

Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
850 855 860

Gly Cys Thr Thr Ile Val Ala Arg Lys Glu Gly Tyr Ile Tyr Lys Val
865 870 875 880

His Thr Gly Thr Thr Lys Ser Leu Ala Gly Phe Thr Ser Thr Thr Gly
885 890 895

Val Lys Lys Ala Val Glu Val Leu Glu Leu Leu Thr Lys Glu Pro Ile
900 905 910

Pro Arg Val Glu Gly Ile Met Ser Asn Asp Phe Leu Val Asp Tyr Leu
915 920 925

Ser Glu Asn Phe Glu Asp Ser Leu Ile Thr Tyr Ser Ser Ser Glu Lys
930 935 940

Lys Pro Asp Ser Gln Ile Thr Ile Ile Arg Asp Asn Val Ser Val Phe
945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu His Gly Phe Gly Thr Ser Ala
965 970 975

Thr Val Leu Val Arg Val Asp Gly Asn Val Val Val Arg Ser Leu Ser
980 985 990

Glu Ser Tyr Ser Leu Asn Ala Asp Ala Ser Glu Ile Ser Val Leu Lys
995 1000 1005

Val Phe Ser Lys Lys Phe
1010

<210> 10
<211> 454
<212> PRT
<213> Escherichia coli

<400> 10
Met Val Asp Met Ile Asn Glu Ser Ala Arg Gln Thr Pro Val Ile Ala
1 5 10 15

Gln Thr Asp Val Leu Val Ile Gly Gly Gly Pro Ala Gly Leu Ser Ala
20 25 30

Ala Ile Ala Ala Gly Arg Leu Gly Ala Arg Thr Met Ile Val Glu Arg
35 40 45

Tyr Gly Ser Leu Gly Gly Val Leu Thr Gln Val Gly Val Glu Ser Phe
50 55 60

Ala Trp Tyr Arg His Pro Gly Thr Glu Asp Cys Glu Gly Ile Cys Arg
65 70 75 80

Glu Tyr Glu Gly Arg Ala Arg Ala Leu Gly Phe Thr Arg Pro Glu Pro
85 90 95

Gln Ser Ile Ser Glu Val Ile Asp Thr Glu Gly Phe Lys Val Val Ala
100 105 110

Asp Gln Met Ile Thr Glu Ser Gly Val Glu Pro Leu Tyr His Ser Trp
115 120 125

Val Val Asp Val Ile Lys Asp Gly Asp Thr Leu Cys Gly Val Ile Val
130 135 140

Glu Asn Lys Ser Gly Arg Gly Ala Ile Leu Ala Lys Arg Ile Val Asp
145 150 155 160

Cys Thr Gly Asp Ala Asp Ile Ala Ala Arg Ala Gly Ala Pro Trp Thr
165 170 175

Lys Arg Ser Lys Asp Gln Leu Met Gly Val Thr Val Met Phe Ser Cys
180 185 190

Ala Gly Val Asp Val Ala Arg Phe Asn Arg Phe Val Ala Glu Glu Leu
195 200 205

Lys Pro Thr Tyr Ala Asp Trp Gly Lys Asn Trp Thr Ile Gln Thr Thr
210 215 220

Gly Lys Glu Asp Pro Met Phe Ser Pro Tyr Met Glu Asp Ile Phe Thr
225 230 235 240

Arg Ala Gln Gln Asp Gly Val Ile Pro Gly Asp Ala Gln Ala Ile Ala
245 250 255

Gly Thr Trp Ser Thr Phe Ser Glu Ser Gly Glu Ala Phe Gln Met Asn
260 265 270

Met Val Tyr Ala Phe Gly Phe Asp Cys Thr Asp Val Phe Asp Leu Thr
275 280 285

Lys Ala Glu Ile Ala Gly Arg Gln Gln Ala Leu Trp Ala Ile Asp Ala
290 295 300

Leu Arg His Tyr Val Pro Gly Phe Glu Asn Val Arg Leu Arg Asn Phe
305 310 315 320

Gly Ala Thr Leu Gly Thr Arg Glu Ser Arg Leu Ile Glu Gly Glu Ile
325 330 335

Arg Ile Ala Asp Asp Tyr Val Leu Asn Gln Gly Arg Cys Ser Asp Ser
340 345 350

Val Gly Ile Phe Pro Glu Phe Ile Asp Gly Ser Gly Tyr Leu Ile Leu
355 360 365

Pro Thr Thr Gly Arg Phe Phe Gln Ile Pro Tyr Gly Cys Leu Val Pro
370 375 380

Gln Lys Val Glu Asn Leu Leu Val Ala Gly Arg Cys Ile Ser Ala Gly
385 390 395 400

Val Val Ala His Thr Ser Met Arg Asn Met Met Cys Cys Ala Val Thr
405 410 415

Gly Glu Ala Ala Gly Thr Ala Ala Val Val Ser Leu Gln Gln Asn Cys
420 425 430

Thr Val Arg Gln Val Ala Ile Pro Asp Leu Gln Asn Thr Leu Gln Gln
435 440 445

Gln Gly Val Arg Leu Ala
450

<210> 11

<211> 253

<212> PRT

<213> Escherichia coli

<400> 11

Met Ser Ala Lys Arg Arg Leu Leu Ile Ala Cys Thr Leu Ile Thr Ala
1 5 10 15

Ile Tyr His Phe Pro Ala Tyr Ser Ser Leu Glu Tyr Lys Gly Thr Phe
20 25 30

Gly Ser Ile Asn Ala Gly Tyr Ala Asp Trp Asn Ser Gly Phe Val Asn
35 40 45

Thr His Arg Gly Glu Val Trp Lys Val Thr Ala Asp Phe Gly Val Asn
50 55 60

Phe Lys Glu Ala Glu Phe Tyr Ser Phe Tyr Glu Ser Asn Val Leu Asn
65 70 75 80

His Ala Val Ala Gly Arg Asn His Thr Val Ser Ala Met Thr His Val
85 90 95

Arg Leu Phe Asp Ser Asp Met Thr Phe Phe Gly Lys Ile Tyr Gly Gln
100 105 110

Trp Asp Asn Ser Trp Gly Asp Asp Leu Asp Met Phe Tyr Gly Phe Gly
115 120 125

Tyr Leu Gly Trp Asn Gly Glu Trp Gly Phe Phe Lys Pro Tyr Ile Gly
130 135 140

Leu His Asn Gln Ser Gly Asp Tyr Val Ser Ala Lys Tyr Gly Gln Thr
145 150 155 160

Asn Gly Trp Asn Gly Tyr Val Val Gly Trp Thr Ala Val Leu Pro Phe
165 170 175

Thr Leu Phe Asp Glu Lys Phe Val Leu Ser Asn Trp Asn Glu Ile Glu
180 185 190

Leu Asp Arg Asn Asp Ala Tyr Thr Glu Gln Gln Phe Gly Arg Asn Gly
195 200 205

Leu Asn Gly Gly Leu Thr Ile Ala Trp Lys Phe Tyr Pro Arg Trp Lys
210 215 220

Ala Ser Val Thr Trp Arg Tyr Phe Asp Asn Lys Leu Gly Tyr Asp Gly
225 230 235 240

Phe Gly Asp Gln Met Ile Tyr Met Leu Gly Tyr Asp Phe
245 250

<210> 12

<211> 492

<212> PRT

<213> Escherichia coli

<400> 12

Met Ala Ser Leu Ile Gly Leu Ala Val Cys Thr Gly Asn Ala Phe Ser
1 5 10 15

Pro Ala Leu Ala Ala Glu Ala Lys Gln Pro Asn Leu Val Ile Ile Met
20 25 30

Ala Asp Asp Leu Gly Tyr Gly Asp Leu Ala Thr Tyr Gly His Gln Ile
35 40 45

Val Lys Thr Pro Asn Ile Asp Arg Leu Ala Gln Glu Gly Val Lys Phe
50 55 60

Thr Asp Tyr Tyr Ala Pro Ala Pro Leu Ser Ser Pro Ser Arg Ala Gly
65 70 75 80

Leu Leu Thr Gly Arg Met Pro Phe Arg Thr Gly Ile Arg Ser Trp Ile
85 90 95

Pro Ser Gly Lys Asp Val Ala Leu Gly Arg Asn Glu Leu Thr Ile Ala
100 105 110

Asn Leu Leu Lys Ala Gln Gly Tyr Asp Thr Ala Met Met Gly Lys Leu
115 120 125

His Leu Asn Ala Gly Gly Asp Arg Thr Asp Gln Pro Gln Ala Gln Asp
130 135 140

Met Gly Phe Asp Tyr Ser Leu Ala Asn Thr Ala Gly Phe Val Thr Asp
145 150 155 160

Ala Thr Leu Asp Asn Ala Lys Glu Arg Pro Arg Tyr Gly Met Val Tyr
165 170 175

Pro Thr Gly Trp Leu Arg Asn Gly Gln Pro Thr Pro Arg Ala Asp Lys
180 185 190

Met Ser Gly Glu Tyr Val Ser Ser Glu Val Val Asn Trp Leu Asp Asn
195 200 205

Lys Lys Asp Ser Lys Pro Phe Phe Leu Tyr Val Ala Phe Thr Glu Val
210 215 220

His Ser Pro Leu Ala Ser Pro Lys Lys Tyr Leu Asp Met Tyr Ser Gln
225 230 235 240

Tyr Met Ser Ala Tyr Gln Lys Gln His Pro Asp Leu Phe Tyr Gly Asp
245 250 255

Trp Ala Asp Lys Pro Trp Arg Gly Val Gly Glu Tyr Tyr Ala Asn Ile
260 265 270

Ser Tyr Leu Asp Ala Gln Val Gly Lys Val Leu Asp Lys Ile Lys Ala
275 280 285

Met Gly Glu Glu Asp Asn Thr Ile Val Ile Phe Thr Ser Asp Asn Gly
290 295 300

Pro Val Thr Arg Glu Ala Arg Lys Val Tyr Glu Leu Asn Leu Ala Gly
305 310 315 320

Glu Thr Asp Gly Leu Arg Gly Arg Lys Asp Asn Leu Trp Glu Gly Gly
325 330 335

Ile Arg Val Pro Ala Ile Ile Lys Tyr Gly Lys His Leu Pro Gln Gly
340 345 350

Met Val Ser Asp Thr Pro Val Tyr Gly Leu Asp Trp Met Pro Thr Leu
355 360 365

Ala Lys Met Met Asn Phe Lys Leu Pro Thr Asp Arg Thr Phe Asp Gly
370 375 380

Glu Ser Leu Val Pro Val Leu Glu Gln Lys Ala Leu Lys Arg Glu Lys
385 390 395 400

Pro Leu Ile Phe Gly Ile Asp Met Pro Phe Gln Asp Asp Pro Thr Asp
405 410 415

Glu Trp Ala Ile Arg Asp Gly Asp Trp Lys Met Ile Ile Asp Arg Asn
420 425 430

Asn Lys Pro Lys Tyr Leu Tyr Asn Leu Lys Ser Asp Arg Tyr Glu Thr
435 440 445

Leu Asn Leu Ile Gly Lys Lys Pro Asp Ile Glu Lys Gln Met Tyr Gly
450 455 460

Lys Phe Leu Lys Tyr Lys Thr Asp Ile Asp Asn Asp Ser Leu Met Lys
465 470 475 480

Ala Arg Gly Asp Lys Pro Glu Ala Val Thr Trp Gly
485 490

<210> 13
<211> 345
<212> PRT
<213> Escherichia coli

<400> 13
Leu Ile Ser Leu Ser Phe Ile Pro Val Met Ser Ala Leu Pro Gly Pro
1 5 10 15

Ile Ala Lys Gly Phe Arg Asn Glu Arg Gly Phe Val Thr Thr Thr Ile
20 25 30

Cys Ala Met Gly Glu Leu Leu Ala Glu Phe Leu Ser Arg Asn Pro His
35 40 45

Gln Lys Phe Thr Gln Pro Gly Glu Phe Ile Gly Pro Phe Pro Ser Gly
50 55 60

Ala Pro Ala Ile Phe Ala Ala Gln Val Ala Lys Leu Ser His Arg Ala
65 70 75 80

Ile Phe Phe Gly Cys Val Gly Asn Asp Asp Phe Ala Arg Leu Ile Ile
85 90 95

Glu Arg Leu Arg His Glu Gly Val Ile Thr Asp Gly Ile His Val Met
100 105 110

Asn Asn Ala Val Thr Gly Thr Ala Phe Val Ser Tyr Gln Asn Pro Gln
115 120 125

Gln Arg Asp Phe Val Phe Asn Ile Pro Asn Ser Ala Cys Gly Leu Phe
130 135 140

Thr Ala Glu His Ile Asp Lys Asp Leu Leu Lys Gln Cys Asn His Leu
145 150 155 160

His Ile Val Gly Ser Ser Leu Phe Ser Phe Arg Met Ile Asp Val Met
165 170 175

Arg Lys Ala Ile Thr Thr Ile Lys Ser Ala Gly Gly Thr Val Ser Phe
180 185 190

Asp Pro Asn Ile Arg Lys Glu Met Leu Ser Ile Pro Glu Met Ala Gln
195 200 205

Ala Leu Asp Tyr Leu Ile Glu Tyr Thr Asp Ile Phe Ile Pro Ser Glu
210 215 220

Ser Glu Leu Pro Phe Phe Ala Arg His Lys Asn Leu Ser Glu Glu Gln
225 230 235 240

Ile Val Ser Asp Leu Leu His Gly Gly Val Lys His Val Ala Ile Lys
245 250 255

Arg Ala Gln Arg Gly Ala Ser Tyr Tyr Lys Leu Lys Asn Gly Thr Leu
260 265 270

His Ala Gln His Val Ala Gly His Asp Ile Glu Ile Ile Asp Pro Thr
275 280 285

Gly Ala Gly Asp Cys Phe Gly Ala Thr Phe Ile Thr Leu Phe Leu Ser
290 295 300

Gly Phe Pro Ala His Lys Ala Leu Gln Tyr Ala Asn Ala Ser Gly Ala
305 310 315 320

Leu Ala Val Met Arg Gln Gly Pro Met Glu Gly Ile Ser Ser Leu Ala
325 330 335

Asp Ile Glu Asp Phe Leu Gln Gln His
340 345

<210> 14
<211> 192
<212> PRT
<213> Escherichia coli

<400> 14
Met Tyr Met Pro Gly Lys Gln Met Leu Cys Cys Ile Leu Ile Ser Ile
1 5 10 15

Ile Ser Glu Gly Asp Met Lys Ile Phe Ile Ser Leu Phe Leu Phe Ile
20 25 30

Ile Ser Thr Asn Ser Phe Ala Asp Asp Ile Thr His Ala Gly Val Val
35 40 45

Arg Ile Glu Gly Leu Ile Thr Glu Lys Thr Cys Ile Ile Ser Asp Glu
50 55 60

Ser Lys Asn Phe Thr Val Asn Met Pro Asp Val Pro Ser Ser Ser Val
65 70 75 80

Arg Ser Ala Gly Asp Val Thr Glu Lys Val Tyr Phe Ser Ile Thr Leu
85 90 95

Thr Arg Cys Gly Ser Asp Val Gly Asn Ala Tyr Ile Lys Phe Thr Gly
100 105 110

Asn Thr Val Ser Glu Asp Ala Ser Leu Tyr Lys Leu Glu Asp Gly Ser
115 120 125

Val Glu Gly Leu Ala Leu Thr Ile Phe Asp Lys Asn Lys Gly Ser Ile
130 135 140

Ser Asn Asp Val Lys Ser Met Val Phe Ser Leu Thr Ser Ser Val Asp
145 150 155 160

Asn Ile Leu His Phe Phe Ala Ala Tyr Lys Ala Leu Lys Asn Asn Val
165 170 175

Gln Pro Gly Asp Ala Asn Ala Ser Val Ser Phe Ile Val Thr Tyr Asp
180 185 190

<210> 15
<211> 201
<212> PRT

<213> Escherichia coli

<400> 15

Met Ile Lys Phe Arg Leu Tyr Ile Pro Pro Val Ile Leu Gly Phe Val
1 5 10 15

Ile Val Pro Leu Leu Val Trp Pro Thr Val Ile Ala Leu Ala Val Leu
20 25 30

Ile Phe Thr Leu Thr Phe Leu Ala Glu Ile Ile Phe Ser Phe Pro Leu
35 40 45

Leu Val Val Arg Ile Ser Leu Gln Glu Leu Gln Leu Glu Leu Leu Val
50 55 60

Val Tyr Ala Leu Phe Phe Ser Val Met Gly Gly Ile Gly Trp Gln Phe
65 70 75 80

Ser Arg Arg Thr Pro Pro Glu Leu Lys Asn Arg Leu His Cys Trp Leu
85 90 95

Val Phe Ser Pro Val Tyr Phe Trp Leu Ile Leu Ser Asn Phe Ile Leu
100 105 110

Tyr Ile Ser Pro Glu Lys Ser Ala Leu Leu Glu Asn Ile Arg Asn Phe
115 120 125

Phe Leu Thr Phe Val Trp Leu Pro Leu Asn Phe Ser Pro Phe Trp Pro
130 135 140

Gln Pro Trp Thr Asp Phe Val Gly Pro Ile Ser Ala Gln Leu Gly Phe
145 150 155 160

Ala Leu Gly Tyr Tyr Cys Gln Trp Arg Ser Lys Asn Arg Ser His Arg
165 170 175

Lys Lys Trp Gly Asp Trp Val Thr Cys Leu Ser Leu Ala Ile Leu Ala
180 185 190

Leu Gly Pro Leu Phe Asn Tyr Leu Gln
195 200

<210> 16

<211> 234

<212> PRT

<213> Escherichia coli

<400> 16

Met Lys Phe Asn Leu Ser Asn Leu Ser Ala Val Leu Leu Ala Ser Gly
1 5 10 15

Met Leu Met Ser Thr Ala Val Thr Ala Ala Pro Gly Asp Ala Thr Gln
20 25 30

Phe Gly Gly Ala Asp Thr Asp Trp Ser Thr Val Asp Tyr Pro Arg Leu
35 40 45

Thr Asp Met Asp Asp Asn Val Asp Ser Met Gly Gly Lys Ile Arg Phe
50 55 60

Thr Gly Arg Val Val Lys Ala Thr Cys Lys Val Ala Thr Asp Ser Lys
65 70 75 80

Gln Ile Glu Val Val Leu Pro Val Val Pro Ser Asn Leu Phe Thr Gly
85 90 95

Ile Asp Val Glu Ala Gln Gly Ala Ser Asn Gln Thr Asp Phe Asn Ile
100 105 110

Asn Leu Thr Glu Cys Ser Asn Thr Asp Asp Gln Lys Ile Glu Phe Arg
115 120 125

Phe Thr Gly Thr Ala Asp Ser Ala Asn Lys Thr Leu Ala Asn Glu Val
130 135 140

Glu Gly Ser Thr Asp Ala Asp Asn Ser Gly Asn Ala Gly Ala Thr Gly
145 150 155 160

Val Gly Ile Arg Ile Tyr Ser Lys Gly Thr Thr Asn Asn Gly Leu Ile
165 170 175

Asn Leu Asn Thr Thr Ala Ala Glu Gly Ser Ala Ser Thr Ala Ala Tyr
180 185 190

Thr Ile Pro Gly Asn Ala Thr Thr His Asp Phe Ser Ala Ala Phe Thr
195 200 205

Ala Gly Tyr Ala Gln Asn Gly Ser Thr Val Ala Pro Gly Val Val Lys

210	215	220
Ser Thr Ala Ser Phe Val Val Leu Tyr Glu		
225	230	
<210> 17 <211> 336 <212> PRT <213> Escherichia coli <400> 17		
Met Arg Ile His Thr Tyr Trp Tyr Arg Arg Tyr Phe Ile Leu Leu Ile		
1	5	10 15
Ile Ile Phe Ser Asn Val Leu Ser Ser Ile Ala Asn Ala Glu Asp Met		
	20	25 30
Gly Arg Glu Arg Ala Tyr Cys Tyr Pro Gly Ser Pro Ser Asn Asn Thr		
	35	40 45
Thr Pro Ala Ser Phe Ser Tyr Asn Phe Gly Thr Ile Val Val Ser Asp		
	50	55 60
Val Asn Lys Asn Ala Pro Gly Thr Val Leu Pro Ser Gln Ile Trp Lys		
65	70	75 80
Val Gly Thr Tyr Lys Ala Tyr Cys Asn Ser Leu Asp Asp Tyr Glu Ile		
	85	90 95
Tyr Phe Ser Ala Val Ser Gly Ile Asp Pro Ser Gly Ala Ser Gly Asp		
	100	105 110
His Gln Gly Ser Asp Val Phe Ile Pro Leu Thr His Glu Ile Ser Val		
	115	120 125
Ser Thr His Ile Lys Leu Tyr Asn Gln Asn Gly Thr Met Thr Asp Lys		
	130	135 140
Ile Val Pro Phe Glu Asn Tyr Asn Thr Asn Tyr Pro Gly Asp Arg Ser		
145	150	155 160
Lys Pro Ser Asn Trp Ala Ser Gly Thr Glu Gly Tyr Ile Lys Ile Arg		
	165	170 175

Ile Asp Lys Lys Ile Ile Ser Asp Val Ser Leu Ser Asn Val Leu Leu
180 185 190

Val Ser Leu Tyr Val Ser Gln Ile Pro Thr Glu His Gly Pro Ile Pro
195 200 205

Val Phe Asn Ala Tyr Ile Gly Asn Leu Asn Ile Gln Val Pro Gln Gly
210 215 220

Cys Thr Ile Asn Glu Gly Thr Ser Phe Thr Val Asn Met Pro Asp Val
225 230 235 240

Trp Ala Ser Glu Leu Ser Arg Ala Gly Ala Gly Ala Lys Pro Ala Gly
245 250 255

Val Thr Pro Val Ala Thr Thr Ile Pro Ile Asn Cys Thr Asn Lys Asp
260 265 270

Thr Asp Ala Val Met Thr Leu Val Phe Asp Gly Asn Ile Ser Ala Thr
275 280 285

Arg Asp Thr Asn Gly Lys Gln Ser Ile Ile Gln Ala Gln Asp Asn Pro
290 295 300

Asp Val Gly Ile Met Ile Met Asp Ser Gln Gln Asn Ser Val Asp Leu
305 310 315 320

Asn Ala Leu Ala Thr Ser Val Gly Val Pro Phe Arg Leu Val Glu Asn
325 330 335

<210> 18

<211> 864

<212> PRT

<213> Escherichia coli

<400> 18

Met Asn Leu Lys Leu Lys Arg Cys Glu Tyr Trp Met Ala Ala Gln Lys
1 5 10 15

Gln Met Lys Arg Val Val Pro Leu Leu Leu Val Ile Met Pro Ala Cys
20 25 30

Ser Ile Ala Gly Met Arg Phe Asn Pro Ala Phe Leu Ser Gly Asp Thr
35 40 45

Glu Ala Val Ala Asp Leu Ser Arg Phe Glu Lys Gly Met Thr Tyr Leu
50 55 60

Pro Gly Ser Tyr Glu Val Glu Val Trp Val Asn Asp Ser Pro Leu Leu
65 70 75 80

Ser Arg Thr Val Thr Phe Lys Ala Asp Asp Glu Asn Gln Leu Ile Pro
85 90 95

Cys Leu Ser Leu Ala Asp Leu Leu Ser Leu Gly Ile Asn Lys Asn Ala
100 105 110

Leu Pro Glu Gln Ala Leu Ala Ser Ser Glu Asn Ser Cys Leu Asp Leu
115 120 125

Arg Ile Trp Phe Pro Asp Val His Tyr Met Pro Glu Leu Asp Ala Gln
130 135 140

Arg Leu Lys Leu Thr Phe Pro Gln Ala Ile Ile Lys Arg Asp Ala Arg
145 150 155 160

Gly Tyr Ile Pro Pro Glu Gln Trp Asp Asn Gly Ile Thr Ala Phe Leu
165 170 175

Leu Asn Tyr Asp Phe Ser Gly Asn Asn Asp Arg Gly Asp Tyr Ser Ser
180 185 190

Asn Asn Tyr Tyr Leu Asn Leu Arg Ala Gly Ile Asn Ile Gly Ala Trp
195 200 205

Arg Phe Arg Asp Tyr Ser Thr Trp Ser Arg Gly Ser Asn Ser Ala Gly
210 215 220

Lys Leu Glu His Ile Ser Ser Thr Leu Gln Arg Val Ile Ile Pro Phe
225 230 235 240

Arg Ser Glu Leu Thr Leu Gly Asp Thr Trp Ser Ser Ser Asp Val Phe
245 250 255

Asp Ser Val Ser Ile Arg Gly Ile Lys Leu Glu Ser Asp Glu Asn Met
260 265 270

Leu Pro Asp Ser Gln Ser Gly Phe Ala Pro Thr Val Arg Gly Ile Ala
275 280 285

Lys Ser Arg Ala Gln Val Thr Ile Lys Gln Asn Gly Tyr Val Ile Tyr
290 295 300

Gln Thr Tyr Met Pro Pro Gly Pro Phe Glu Ile Ser Asp Leu Asn Pro
305 310 315 320

Thr Ser Ser Ala Gly Asp Leu Glu Val Thr Ile Lys Glu Ser Asp Asn
325 330 335

Ser Glu Thr Val Tyr Thr Val Pro Tyr Ala Ala Val Pro Ile Leu Gln
340 345 350

Arg Glu Gly His Leu Lys Tyr Ser Thr Thr Val Gly Gln Tyr Arg Ser
355 360 365

Asn Ser Tyr Asn Gln Lys Ser Pro Tyr Val Phe Gln Gly Glu Leu Ile
370 375 380

Trp Gly Leu Pro Trp Asp Ile Thr Ala Tyr Gly Gly Ala Gln Phe Ser
385 390 395 400

Glu Asp Tyr Arg Ala Leu Ala Leu Gly Leu Gly Leu Asn Leu Gly Val
405 410 415

Phe Gly Ala Thr Ser Phe Asp Val Thr Gln Ala Asn Ser Ser Leu Val
420 425 430

Asp Gly Ser Lys His Gln Gly Gln Ser Tyr Arg Phe Leu Tyr Ser Lys
435 440 445

Ser Leu Val Gln Thr Gly Thr Ala Phe His Ile Ile Gly Tyr Arg Tyr
450 455 460

Ser Thr Gln Gly Phe Tyr Thr Leu Ser Asp Thr Thr Tyr Gln Gln Met
465 470 475 480

Ser Gly Thr Val Val Asp Pro Lys Thr Leu Asp Asp Lys Asp Tyr Val
485 490 495

Tyr Asn Trp Asn Asp Phe Tyr Asn Leu Arg Tyr Ser Lys Arg Gly Lys

500					505					510					
Phe	Gln	Ala	Ser	Val	Ser	Gln	Pro	Phe	Gly	Asn	Tyr	Gly	Ser	Met	Tyr
	515						520					525			
Leu	Ser	Ala	Ser	Gln	Gln	Thr	Tyr	Trp	Asn	Thr	Asp	Lys	Lys	Asp	Ser
	530					535					540				
Leu	Tyr	Gln	Val	Gly	Tyr	Asn	Thr	Ser	Ile	Lys	Gly	Ile	Tyr	Leu	Asn
545					550					555					560
Val	Ala	Trp	Asn	Tyr	Ser	Lys	Ser	Pro	Gly	Thr	Asn	Ala	Asp	Lys	Ile
			565						570					575	
Val	Ser	Leu	Asn	Val	Ser	Leu	Pro	Ile	Ser	Asn	Trp	Leu	Ser	Ser	Thr
			580					585					590		
Asn	Asp	Gly	Arg	Ser	Ser	Ser	Asn	Ala	Met	Thr	Ala	Thr	Tyr	Gly	Tyr
		595					600					605			
Ser	Gln	Asp	Asn	His	Gly	Gln	Val	Asn	Gln	Tyr	Thr	Gly	Val	Ser	Gly
	610					615					620				
Ser	Leu	Leu	Glu	Gln	His	Asn	Leu	Ser	Tyr	Asn	Ile	Gln	His	Gly	Phe
625					630					635					640
Ala	Asn	Gln	Asp	Asn	Ser	Ser	Ser	Gly	Ser	Val	Gly	Val	Asn	Tyr	Arg
				645					650					655	
Gly	Ala	Tyr	Gly	Ser	Leu	Asn	Ser	Ala	Tyr	Ser	Tyr	Asp	Asn	Glu	Gly
			660					665					670		
Asn	Gln	Gln	Ile	Asn	Tyr	Gly	Ile	Ser	Gly	Ala	Leu	Val	Val	His	Glu
		675					680					685			
Asn	Gly	Leu	Thr	Leu	Ser	Gln	Pro	Leu	Gly	Glu	Thr	Asn	Val	Leu	Ile
	690					695					700				
Lys	Ala	Pro	Gly	Ala	Asn	Asn	Val	Asp	Val	Gln	Arg	Gly	Thr	Gly	Ile
705					710					715					720
Ser	Thr	Asp	Trp	Arg	Gly	Tyr	Ala	Val	Val	Pro	Tyr	Ala	Thr	Glu	Tyr
				725					730					735	

Arg Arg Asn Asn Ile Ser Leu Asp Pro Met Ser Met Asn Met His Thr
740 745 750

Glu Leu Asp Ile Thr Ser Thr Glu Val Ile Pro Gly Lys Gly Ala Leu
755 760 765

Val Arg Ala Glu Phe Ala Ala His Ile Gly Ile Arg Gly Leu Phe Thr
770 775 780

Val Arg Tyr Arg Asn Lys Ser Val Pro Phe Gly Ala Thr Ala Ser Ala
785 790 795 800

Gln Ile Lys Asn Ser Ser Gln Ile Thr Gly Ile Val Gly Asp Asn Gly
805 810 815

Gln Leu Tyr Leu Ser Gly Leu Pro Leu Glu Gly Val Ile Asn Ile Gln
820 825 830

Trp Gly Asp Gly Val Gln Gln Lys Cys Gln Ala Asn Tyr Lys Leu Pro
835 840 845

Glu Thr Glu Leu Asp Asn Pro Val Ser Tyr Ala Thr Leu Glu Cys Arg
850 855 860

<210> 19

<211> 169

<212> PRT

<213> Escherichia coli

<400> 19

Met Gly Ala Ile Tyr Val Lys Arg Leu Ile Leu Ser Val Ala Leu Ile
1 5 10 15

Ile Pro Ile Ala Ser Asn Ala Ser Asp Ala Leu Asn Gln Pro Ser Ser
20 25 30

Ser Leu Asn Asp Gly Val Glu Thr Phe Phe Ile Ser Cys Phe Asp Met
35 40 45

Pro Gln Glu Thr Thr Thr Asp Met Asp Ala Cys Gln Arg Val Gln Leu
50 55 60

Ala Gln Val Ser Trp Val Lys Asn Lys Tyr Ser Val Ala Ala Leu Asn

65					70						75				80
Arg	Leu	Lys	Gln	Asp	Asn	Lys	Asp	Asp	Pro	Gln	Arg	Leu	Gln	Glu	Leu
				85					90					95	
Thr	Ala	Ser	Phe	Asn	Ala	Glu	Ser	Glu	Ala	Trp	Thr	Glu	Leu	Ile	Glu
			100					105					110		
Lys	Ala	Ser	Lys	Ser	Val	Gln	Val	Asp	Tyr	Val	Gly	Gly	Thr	Ile	Ala
		115					120					125			
Gly	Thr	Ala	Val	Ala	Ser	Arg	Gln	Ile	Gly	Leu	Leu	Glu	Leu	Gln	Ser
	130					135					140				
His	Asp	Ile	Trp	Glu	His	Trp	Leu	Arg	Ser	Arg	Gly	Leu	Asn	Ser	Ser
145					150					155					160
Ser	Phe	Ala	Arg	Thr	Lys	Val	Gln	Ile							
				165											
<210> 20															
<211> 713															
<212> PRT															
<213> Escherichia coli															
<400> 20															
Met	Ala	Met	Phe	Thr	Pro	Ser	Phe	Ser	Gly	Leu	Lys	Gly	Arg	Ala	Leu
1				5					10					15	
Phe	Ser	Leu	Leu	Phe	Ala	Ala	Pro	Met	Ile	His	Ala	Thr	Asp	Ser	Val
			20					25					30		
Thr	Thr	Lys	Asp	Gly	Glu	Thr	Ile	Thr	Val	Thr	Ala	Asp	Ala	Asn	Thr
		35					40					45			
Ala	Thr	Glu	Ala	Thr	Asp	Gly	Tyr	Gln	Pro	Leu	Ser	Thr	Ser	Thr	Ala
	50					55					60				
Thr	Leu	Thr	Asp	Met	Pro	Met	Leu	Asp	Ile	Pro	Gln	Val	Val	Asn	Thr
65					70					75					80
Val	Ser	Asp	Gln	Val	Leu	Glu	Asn	Gln	Asn	Ala	Thr	Thr	Leu	Asp	Glu
				85					90					95	

Ala Leu Tyr Asn Val Ser Asn Val Val Gln Thr Asn Thr Leu Gly Gly
100 105 110

Thr Gln Asp Ala Phe Val Arg Arg Gly Phe Gly Ala Asn Arg Asp Gly
115 120 125

Ser Ile Met Thr Asn Gly Leu Arg Thr Val Leu Pro Arg Ser Phe Asn
130 135 140

Ala Ala Thr Glu Arg Val Glu Val Leu Lys Gly Pro Ala Ser Thr Leu
145 150 155 160

Tyr Gly Ile Leu Asp Pro Gly Gly Leu Ile Asn Val Val Thr Lys Arg
165 170 175

Pro Glu Lys Thr Phe His Gly Ser Val Ser Ala Thr Ser Ser Ser Phe
180 185 190

Gly Gly Gly Thr Gly Gln Leu Asp Ile Thr Gly Pro Ile Glu Gly Thr
195 200 205

Gln Leu Ala Tyr Arg Leu Thr Gly Glu Val Gln Asp Glu Asp Tyr Trp
210 215 220

Arg Asn Phe Gly Lys Glu Arg Ser Thr Phe Ile Ala Pro Ser Leu Thr
225 230 235 240

Trp Phe Gly Asp Asn Ala Thr Val Thr Met Leu Tyr Ser His Arg Asp
245 250 255

Tyr Lys Thr Pro Phe Asp Arg Gly Thr Ile Phe Asp Leu Thr Thr Lys
260 265 270

Gln Pro Val Asn Val Asp Arg Lys Ile Arg Phe Asp Glu Pro Phe Asn
275 280 285

Ile Thr Asp Gly Gln Ser Asp Leu Ala Gln Leu Asn Ala Glu Tyr His
290 295 300

Leu Asn Ser Gln Trp Thr Ala Arg Phe Asp Tyr Ser Tyr Ser Gln Asp
305 310 315 320

Lys Tyr Ser Asp Asn Gln Ala Arg Val Thr Ala Tyr Asp Ala Thr Thr

					325						330					335
Gly	Thr	Leu	Thr	Arg	Arg	Val	Asp	Ala	Thr	Gln	Gly	Ser	Thr	Gln	Arg	
			340					345					350			
Met	His	Ala	Thr	Arg	Ala	Asp	Leu	Gln	Gly	Asn	Val	Asp	Ile	Ala	Gly	
		355					360					365				
Phe	Tyr	Asn	Glu	Ile	Leu	Gly	Gly	Val	Ser	Tyr	Glu	Tyr	Tyr	Asp	Leu	
	370					375					380					
Leu	Arg	Thr	Asp	Met	Ile	Arg	Cys	Lys	Lys	Ala	Lys	Asp	Phe	Asn	Ile	
385					390					395					400	
Tyr	Asn	Pro	Val	Tyr	Gly	Asn	Thr	Ser	Lys	Cys	Thr	Thr	Val	Ser	Ala	
			405						410					415		
Ser	Asp	Ser	Asp	Gln	Thr	Ile	Lys	Gln	Glu	Asn	Tyr	Ser	Ala	Tyr	Ala	
			420					425					430			
Gln	Asp	Ala	Leu	Tyr	Leu	Thr	Asp	Asn	Trp	Ile	Ala	Val	Ala	Gly	Ile	
		435					440					445				
Arg	Tyr	Gln	Tyr	Tyr	Thr	Gln	Tyr	Ala	Gly	Lys	Gly	Arg	Pro	Phe	Asn	
	450					455					460					
Val	Asn	Thr	Asp	Ser	Arg	Asp	Glu	Gln	Trp	Thr	Pro	Lys	Leu	Gly	Leu	
465					470					475					480	
Val	Tyr	Lys	Leu	Thr	Pro	Ser	Val	Ser	Leu	Phe	Ala	Asn	Tyr	Ser	Gln	
				485					490					495		
Thr	Phe	Met	Pro	Gln	Ser	Ser	Ile	Ala	Ser	Tyr	Ile	Gly	Asp	Leu	Pro	
			500					505					510			
Pro	Glu	Ser	Ser	Asn	Ala	Tyr	Glu	Val	Gly	Ala	Lys	Phe	Glu	Leu	Phe	
		515					520					525				
Asp	Gly	Ile	Thr	Ala	Asp	Ile	Ala	Leu	Phe	Asp	Ile	His	Lys	Arg	Asn	
	530					535					540					
Val	Leu	Tyr	Thr	Glu	Ser	Ile	Gly	Asp	Glu	Thr	Ile	Ala	Lys	Thr	Ala	
545					550					555					560	

Gly Arg Val Arg Ser Arg Gly Val Glu Val Asp Leu Ala Gly Ala Leu
565 570 575

Thr Glu Asn Ile Asn Ile Ile Ala Ser Tyr Gly Tyr Thr Asp Ala Lys
580 585 590

Val Leu Glu Asp Pro Asp Tyr Ala Gly Lys Pro Leu Pro Asn Val Pro
595 600 605

Arg His Thr Gly Ser Leu Phe Leu Thr Tyr Asp Ile His Asn Met Pro
610 615 620

Gly Asn Asn Thr Leu Thr Phe Gly Gly Gly Gly His Gly Val Ser Arg
625 630 635 640

Arg Ser Ala Thr Asn Gly Ala Asp Tyr Tyr Leu Pro Gly Tyr Phe Val
645 650 655

Ala Asp Ala Phe Ala Ala Tyr Lys Met Lys Leu Gln Tyr Pro Val Thr
660 665 670

Leu Gln Leu Asn Val Lys Asn Leu Phe Asp Lys Thr Tyr Tyr Thr Ser
675 680 685

Ser Ile Ala Thr Asn Asn Leu Gly Asn Gln Ile Gly Asp Pro Arg Glu
690 695 700

Val Gln Phe Thr Val Lys Met Glu Phe
705 710

<210> 21

<211> 606

<212> PRT

<213> Escherichia coli

<400> 21

Met Lys Ile Ser Trp Asn Tyr Ile Phe Lys Asn Lys Trp Arg Phe His
1 5 10 15

Ile Thr Ser Ile Ser Leu Phe Leu Ile Met Leu Ala Val Ser Ile Ala
20 25 30

Phe Leu His Leu Arg Phe Asn Thr Leu Ser Ser Thr Asp Lys Met Arg

35	40	45														
Leu	Glu	Met	Tyr	Lys	Ser	Thr	Leu	Tyr	Ser	Thr	Ile	Glu	Gln	Phe	Tyr	
50						55					60					
Val	Leu	Pro	Tyr	Met	Leu	Ser	Thr	Asp	His	Ile	Ile	Arg	Gln	Ala	Val	
65					70					75					80	
Ile	Thr	Pro	Asp	Asp	Met	Thr	Ser	Ser	Glu	Leu	Asn	Gln	Arg	Ile	Ala	
				85					90					95		
His	Phe	Asn	Thr	Gln	Leu	Lys	Thr	Ala	Ala	Ile	Phe	Ile	Leu	Asp	Thr	
			100					105						110		
Gln	Gly	Lys	Ala	Ile	Ala	Ser	Ser	Asn	Trp	Gln	Asp	Pro	Gly	Ser	Tyr	
		115						120				125				
Val	Gly	Gln	Asn	Tyr	Ser	Tyr	Arg	Pro	Tyr	Tyr	Lys	His	Ala	Met	Ser	
	130					135					140					
Gly	Leu	Asn	Gly	Arg	Phe	Tyr	Gly	Ile	Gly	Ser	Thr	Thr	Asn	Thr	Pro	
145					150					155					160	
Gly	Phe	Phe	Leu	Ser	Thr	Ser	Ile	Lys	Asp	Lys	Gly	Lys	Ile	Val	Gly	
				165					170					175		
Val	Val	Val	Val	Lys	Ile	Ser	Leu	Asn	Glu	Ile	Glu	Lys	Ala	Trp	Ala	
			180					185					190			
Glu	Gly	Pro	Glu	Asn	Ile	Ile	Val	Asn	Asp	Glu	His	Gly	Ile	Ile	Phe	
		195					200					205				
Leu	Ser	Ser	Lys	Ser	Pro	Trp	Arg	Met	Arg	Thr	Leu	Gln	Pro	Leu	Pro	
	210					215					220					
Val	Gln	Ala	Lys	Gln	Lys	Leu	Gln	Ser	Thr	Arg	Gln	Tyr	Ser	Leu	Asp	
225					230					235					240	
Asn	Leu	Leu	Pro	Ala	Asp	Tyr	Tyr	Pro	Cys	Tyr	Thr	Val	Ser	Asn	Phe	
				245					250					255		
Thr	Phe	Leu	Lys	Asp	Lys	Lys	Glu	Gln	Leu	Cys	Leu	Phe	Pro	Gln	Tyr	
			260				265						270			

Tyr Thr Gln Gln Ile Ala Ile Pro Glu Phe Asn Trp Lys Met Thr Ile
275 280 285

Met Val Pro Leu Asp Asn Leu Tyr Trp Ser Trp Ala Ile Ser Leu Val
290 295 300

Ile Thr Leu Ile Ile Tyr Leu Leu Phe Leu Leu Phe Ile Lys Tyr Trp
305 310 315 320

Arg Met Arg Ser His Ala Gln Gln Leu Leu Thr Leu Ala Asn Glu Thr
325 330 335

Leu Glu Lys Gln Val Lys Glu Arg Thr Ser Ala Leu Glu Leu Ile Asn
340 345 350

Gln Lys Leu Ile Gln Glu Ile Lys Glu Arg Ser Gln Ala Glu Gln Val
355 360 365

Leu Gln Ile Thr Arg Ser Glu Leu Ala Glu Ser Ser Lys Leu Ala Ala
370 375 380

Leu Gly Gln Met Ala Thr Glu Ile Ala His Glu Gln Asn Gln Pro Leu
385 390 395 400

Ala Ala Ile His Ala Leu Thr Asp Asn Ala Arg Thr Met Leu Lys Lys
405 410 415

Glu Met Tyr Pro Gln Val Glu Gln Asn Leu Lys His Ile Ile Ser Val
420 425 430

Ile Glu Arg Met Thr Gln Leu Ile Ser Glu Leu Lys Ala Phe Ala Ser
435 440 445

Arg His Arg Val Pro Lys Gly Ser Ala Asp Val Ile Lys Val Met Tyr
450 455 460

Ser Ala Val Ala Leu Leu Asn His Ser Met Glu Lys Asn Asn Ile Glu
465 470 475 480

Arg Arg Ile Lys Ala Pro Ser Met Pro Leu Phe Val Asn Cys Asp Glu
485 490 495

Leu Gly Leu Glu Gln Ile Phe Ser Asn Leu Ile Ser Asn Ala Leu Asp
500 505 510

Ser Met Glu Gly Ser Ser Tyr Lys Arg Leu Asp Ile Ala Ile Arg Gln
515 520 525

Ala Asn Asn Lys Val Ile Ile Thr Ile Lys Asp Ser Gly Gly Gly Phe
530 535 540

Ala Pro Glu Val Val Asp Arg Ile Phe Glu Pro Phe Phe Thr Thr Lys
545 550 555 560

Arg Arg Gly Met Gly Leu Gly Leu Ala Ile Val Ser Glu Ile Val Arg
565 570 575

Asn Ser Asn Gly Ala Leu His Ala Ser Asn His Pro Glu Gly Gly Ala
580 585 590

Val Met Thr Leu Thr Trp Pro Glu Trp Gly Glu Glu His Glu
595 600 605

<210> 22

<211> 101

<212> PRT

<213> Escherichia coli

<400> 22

Val Leu Thr Pro Gln His Leu Arg Cys Val Leu Thr Cys Ser Asp Leu
1 5 10 15

Leu Thr Leu Leu Ser Gly Thr Val Met Ser Gln Met Pro Leu Tyr Phe
20 25 30

Leu Asn Thr Gln Lys Lys Leu Thr Ala His Tyr Glu Trp Leu Gln Ile
35 40 45

Asn Leu Thr Asp Thr Tyr Glu Leu Val Lys Arg Leu Met Pro Ile Pro
50 55 60

Ser Leu Asp Val Val Val Lys Val Gly Lys Leu Val Leu Pro Glu Lys
65 70 75 80

Gly His His Gly Phe Tyr Pro Glu Ala Gly Val Val Tyr Arg Thr Val
85 90 95

Ala Pro Glu Asn Pro
100

<210> 23
<211> 263
<212> PRT
<213> Escherichia coli

<400> 23
Met Met Lys Asn Thr Gly Tyr Ile Leu Ala Leu Cys Leu Thr Ala Ser
1 5 10 15

Gly His Val Leu Ala His Asp Val Trp Ile Thr Gly Lys Gln Ala Glu
20 25 30

Asn Asn Val Thr Ala Glu Ile Gly Tyr Gly His Asn Phe Pro Ser Lys
35 40 45

Gly Thr Ile Pro Asp Arg Arg Asp Phe Phe Glu Asn Pro Arg Leu Tyr
50 55 60

Asn Gly Lys Glu Thr Ile Thr Leu Lys Pro Ala Ser Thr Asp Tyr Val
65 70 75 80

Tyr Lys Thr Glu Ser Ala Ser Lys Asp Asn Gly Tyr Val Leu Ser Thr
85 90 95

Tyr Met Lys Pro Gly Tyr Trp Ser Arg Thr Ser Ser Gly Trp Lys Pro
100 105 110

Val Ser Arg Glu Gly Arg Asn Asp Val Ala Tyr Cys Glu Phe Val Thr
115 120 125

Lys Tyr Ala Lys Ser Phe Ile Pro Gly Glu Gln Gln Met Pro Ala Gln
130 135 140

Leu Tyr Gln Ser Pro Thr Gly His Glu Leu Glu Ile Ile Pro Leu Ser
145 150 155 160

Asp Ile Ser Arg Phe Ser Glu Asn Val Lys Leu Lys Val Leu Tyr Lys
165 170 175

Thr Ser Pro Leu Ala Gly Ala Ile Met Glu Leu Asp Ser Val Ser Tyr

180 185 190
 Leu Thr Ser Ser Arg His Thr His Ala Val Glu His Lys His Pro Val
 195 200 205
 His Lys Ala Glu Leu Thr Phe Val Thr Asn Glu Asp Gly Ile Val Thr
 210 215 220
 Val Pro Ser Leu His Ile Gly Gln Trp Leu Ala Lys Val Gln Asn Lys
 225 230 235 240
 Lys Ser Phe Gln Asp Lys Ser Leu Cys Asp Glu Thr Val Asp Val Ala
 245 250 255
 Thr Leu Ser Phe Ser Arg Asn
 260

<210> 24
 <211> 378
 <212> PRT
 <213> Escherichia coli

<400> 24
 Met Gly Lys Ile Lys Tyr Trp Leu Ile Val Gly Phe Ile Ile Leu Phe
 1 5 10 15
 Ala Ile Phe Tyr Ile Ala Ile Ser Asp Arg Asp Ser Thr Leu Ser Arg
 20 25 30
 Leu Lys Ser Ala Gly Glu Asn Gly Asp Val Glu Ala Gln Tyr Ala Leu
 35 40 45
 Gly Leu Met Tyr Leu Tyr Gly Glu Ile Leu Asp Val Asp Tyr Gln Gln
 50 55 60
 Ala Lys Ile Trp Tyr Glu Lys Ala Ala Asp Gln Asn Asp Pro Arg Ala
 65 70 75 80
 Gln Ala Lys Leu Gly Val Met Tyr Ala Asn Gly Leu Gly Val Asn Gln
 85 90 95
 Asp Tyr Gln Gln Ser Lys Leu Trp Tyr Glu Lys Ala Ala Ala Gln Asn
 100 105 110

Asp Val Asp Ala Gln Phe Leu Leu Gly Glu Met Tyr Asp Asp Gly Leu
115 120 125

Gly Val Ser Gln Asp Tyr Gln His Ala Lys Met Trp Tyr Glu Lys Ala
130 135 140

Ala Ala Gln Asn Asp Glu Arg Ala Gln Val Asn Leu Ala Val Leu Tyr
145 150 155 160

Ala Lys Gly Asn Gly Val Glu Gln Asp Tyr Arg Gln Ala Lys Ser Trp
165 170 175

Tyr Glu Lys Ala Ala Ala Gln Asn Ser Pro Asp Ala Gln Phe Ala Leu
180 185 190

Gly Ile Leu Tyr Ala Asn Ala Asn Gly Val Glu Gln Asp Tyr Gln Gln
195 200 205

Ala Lys Asp Trp Tyr Glu Lys Ala Ala Glu Gln Asn Phe Ala Asn Ala
210 215 220

Gln Phe Asn Leu Gly Met Leu Tyr Tyr Lys Gly Glu Gly Val Lys Gln
225 230 235 240

Asn Phe Arg Gln Ala Arg Glu Trp Phe Glu Lys Ala Ala Ser Gln Asn
245 250 255

Gln Pro Asn Ala Gln Tyr Asn Leu Gly Gln Ile Tyr Tyr Tyr Gly Gln
260 265 270

Gly Val Thr Gln Ser Tyr Arg Gln Ala Lys Asp Trp Phe Glu Lys Ala
275 280 285

Ala Glu Lys Gly His Val Asp Ala Gln Tyr Asn Leu Gly Val Ile Tyr
290 295 300

Glu Asn Gly Glu Gly Val Ser Gln Asn Tyr Gln Gln Ala Lys Ala Trp
305 310 315 320

Tyr Glu Lys Ala Ala Ser Gln Asn Asp Ala Gln Ala Gln Phe Glu Leu
325 330 335

Gly Val Met Asn Glu Leu Gly Gln Gly Glu Ser Ile Asp Leu Lys Gln

340

345

350

Ala Arg His Tyr Tyr Glu Arg Ser Cys Asn Asn Gly Leu Lys Lys Gly
 355 360 365

Cys Glu Arg Leu Lys Glu Leu Leu Tyr Lys
 370 375

<210> 25

<211> 654

<212> PRT

<213> Escherichia coli

<400> 25

Met Asn Val Ile Arg Thr Val Ile Cys Thr Leu Ile Ile Leu Pro Val
 1 5 10 15

Gly Leu Gln Ala Ala Thr Ser His Ser Ser Met Val Lys Asp Thr Ile
 20 25 30

Thr Ile Val Ala Thr Gly Asn Gln Asn Thr Val Phe Glu Thr Pro Ser
 35 40 45

Met Val Ser Val Val Thr Asn Asp Thr Pro Trp Ser Gln Asn Ala Val
 50 55 60

Thr Ser Ala Gly Met Leu Lys Gly Val Ala Gly Leu Ser Gln Thr Gly
 65 70 75 80

Ala Gly Arg Thr Asn Gly Gln Thr Phe Asn Leu Arg Gly Tyr Asp Lys
 85 90 95

Ser Gly Val Leu Val Leu Val Asp Gly Val Arg Gln Leu Ser Asp Met
 100 105 110

Ala Lys Ser Ser Gly Thr Tyr Leu Asp Pro Ala Leu Val Lys Arg Ile
 115 120 125

Glu Val Val Arg Gly Pro Asn Ser Ser Leu Tyr Gly Ser Gly Gly Leu
 130 135 140

Gly Gly Val Val Asp Phe Arg Thr Ala Asp Ala Ala Asp Phe Leu Pro
 145 150 155 160

Pro Gly Glu Thr Asn Gly Leu Ser Leu Trp Gly Asn Ile Ala Ser Gly
165 170 175

Asp His Ser Thr Gly Ser Gly Leu Thr Trp Phe Gly Lys Thr Gly Lys
180 185 190

Thr Asp Ala Leu Leu Ser Val Ile Met Arg Lys Arg Gly Asn Ile Tyr
195 200 205

Gln Ser Asp Gly Glu His Ala Pro Asn Lys Glu Lys Pro Ala Ala Leu
210 215 220

Phe Ala Lys Gly Ser Val Gly Ile Thr Asp Ser Asn Lys Ala Gly Ala
225 230 235 240

Ser Leu Arg Leu Tyr Arg Asn Asn Thr Thr Glu Pro Gly Asn Ser Thr
245 250 255

Gln Thr His Gly Asp Ser Gly Leu Arg Asp Arg Lys Thr Val Gln Asn
260 265 270

Asp Val Gln Phe Trp Tyr Gln Tyr Ala Pro Val Asp Asn Ser Leu Ile
275 280 285

Asn Val Lys Ser Thr Leu Tyr Leu Ser Asp Ile Thr Ile Lys Thr Asn
290 295 300

Gly His Asn Lys Thr Ala Glu Trp Arg Asn Asn Arg Thr Ser Gly Val
305 310 315 320

Asn Val Val Asn Arg Ser His Thr Leu Ile Phe Pro Gly Ala His Gln
325 330 335

Leu Ser Tyr Gly Ala Glu Tyr Tyr Arg Gln Gln Gln Lys Pro Glu Gly
340 345 350

Ser Ala Thr Leu Tyr Pro Glu Gly Asn Ile Asp Phe Thr Ser Leu Tyr
355 360 365

Phe Gln Asp Glu Met Thr Met Lys Ser Tyr Pro Val Asn Ile Ile Val
370 375 380

Gly Ser Arg Tyr Asp Arg Tyr Lys Ser Phe Asn Pro Arg Ala Gly Glu

385					390					395					400
Leu	Lys	Ala	Glu	Arg	Leu	Ser	Pro	Arg	Ala	Ala	Ile	Ser	Val	Ser	Pro
				405					410					415	
Thr	Asp	Trp	Leu	Met	Met	Tyr	Gly	Ser	Ile	Ser	Ser	Ala	Phe	Arg	Ala
			420					425					430		
Pro	Thr	Met	Ala	Glu	Met	Tyr	Arg	Asp	Asp	Val	His	Phe	Tyr	Arg	Lys
		435					440					445			
Gly	Lys	Pro	Asn	Tyr	Trp	Val	Pro	Asn	Leu	Asn	Leu	Lys	Pro	Glu	Asn
	450					455					460				
Asn	Ile	Thr	Arg	Glu	Ile	Gly	Ala	Gly	Ile	Gln	Leu	Asp	Gly	Leu	Leu
465					470					475					480
Thr	Asp	Asn	Asp	Arg	Leu	Gln	Leu	Lys	Gly	Gly	Tyr	Phe	Gly	Thr	Asp
				485					490					495	
Ala	Arg	Asn	Tyr	Ile	Ala	Thr	Arg	Val	Asp	Met	Lys	Arg	Met	Arg	Ser
			500					505					510		
Tyr	Ser	Tyr	Asn	Val	Ser	Arg	Ala	Arg	Ile	Trp	Gly	Trp	Asp	Met	Gln
		515					520					525			
Gly	Asn	Tyr	Gln	Ser	Asp	Tyr	Val	Asp	Trp	Met	Leu	Ser	Tyr	Asn	Arg
	530					535					540				
Thr	Glu	Ser	Met	Asp	Ala	Ser	Ser	Arg	Glu	Trp	Leu	Gly	Ser	Gly	Asn
545					550					555					560
Pro	Asp	Thr	Leu	Ile	Ser	Asp	Ile	Ser	Ile	Pro	Val	Gly	His	Arg	Gly
				565					570					575	
Val	Tyr	Ala	Gly	Trp	Arg	Ala	Glu	Leu	Ser	Ala	Ser	Ala	Thr	His	Val
			580					585					590		
Lys	Lys	Gly	Asp	Pro	His	Gln	Ala	Gly	Tyr	Thr	Ile	His	Ser	Phe	Ser
		595					600					605			
Leu	Ser	Tyr	Lys	Pro	Val	Ser	Val	Lys	Gly	Phe	Glu	Ala	Ser	Val	Thr
	610					615					620				

Leu Asp Asn Ala Phe Asn Lys Leu Ala Met Asn Gly Lys Gly Val Pro
625 630 635 640

Leu Ser Gly Arg Thr Val Ser Leu Tyr Thr Arg Tyr Gln Trp
645 650

<210> 26

<211> 1376

<212> PRT

<213> Escherichia coli

<400> 26

Met Asn Lys Ile Tyr Ala Leu Lys Tyr Cys Tyr Ile Thr Asn Thr Val
1 5 10 15

Lys Val Val Ser Glu Leu Ala Arg Arg Val Cys Lys Gly Ser Thr Arg
20 25 30

Arg Gly Lys Arg Leu Ser Val Leu Thr Ser Leu Ala Leu Ser Ala Leu
35 40 45

Leu Pro Thr Val Ala Gly Ala Ser Thr Val Gly Gly Asn Asn Pro Tyr
50 55 60

Gln Thr Tyr Arg Asp Phe Ala Glu Asn Lys Gly Gln Phe Gln Ala Gly
65 70 75 80

Ala Thr Asn Ile Pro Ile Phe Asn Asn Lys Gly Glu Leu Val Gly His
85 90 95

Leu Asp Lys Ala Pro Met Val Asp Phe Ser Ser Val Asn Val Ser Ser
100 105 110

Asn Pro Gly Val Ala Thr Leu Ile Asn Pro Gln Tyr Ile Ala Ser Val
115 120 125

Lys His Asn Lys Gly Tyr Gln Ser Val Ser Phe Gly Asp Gly Gln Asn
130 135 140

Ser Tyr His Ile Val Asp Arg Asn Glu His Ser Ser Ser Asp Leu His
145 150 155 160

Thr Pro Arg Leu Asp Lys Leu Val Thr Glu Val Ala Pro Ala Thr Val
165 170 175

Thr Ser Ser Ser Thr Ala Asp Ile Leu Asn Pro Ser Lys Tyr Ser Ala
180 185 190

Phe Tyr Arg Ala Gly Ser Gly Ser Gln Tyr Ile Gln Asp Ser Gln Gly
195 200 205

Lys Arg His Trp Val Thr Gly Gly Tyr Gly Tyr Leu Thr Gly Gly Ile
210 215 220

Leu Pro Thr Ser Phe Phe Tyr His Gly Ser Asp Gly Ile Gln Leu Tyr
225 230 235 240

Met Gly Gly Asn Ile His Asp His Ser Ile Leu Pro Ser Phe Gly Glu
245 250 255

Ala Gly Asp Ser Gly Ser Pro Leu Phe Gly Trp Asn Thr Ala Lys Gly
260 265 270

Gln Trp Glu Leu Val Gly Val Tyr Ser Gly Val Gly Gly Gly Thr Asn
275 280 285

Leu Ile Tyr Ser Leu Ile Pro Gln Ser Phe Leu Ser Gln Ile Tyr Ser
290 295 300

Glu Asp Asn Asp Ala Pro Val Phe Phe Asn Ala Ser Ser Gly Ala Pro
305 310 315 320

Leu Gln Trp Lys Phe Asp Ser Ser Thr Gly Thr Gly Ser Leu Lys Gln
325 330 335

Gly Ser Asp Glu Tyr Ala Met His Gly Gln Lys Gly Ser Asp Leu Asn
340 345 350

Ala Gly Lys Asn Leu Thr Phe Leu Gly His Asn Gly Gln Ile Asp Leu
355 360 365

Glu Asn Ser Val Thr Gln Gly Ala Gly Ser Leu Thr Phe Thr Asp Asp
370 375 380

Tyr Thr Val Thr Thr Ser Asn Gly Ser Thr Trp Thr Gly Ala Gly Ile

385					390						395				400
Ile	Val	Asp	Lys	Asp	Ala	Ser	Val	Asn	Trp	Gln	Val	Asn	Gly	Val	Lys
				405					410					415	
Gly	Asp	Asn	Leu	His	Lys	Ile	Gly	Glu	Gly	Thr	Leu	Val	Val	Gln	Gly
			420					425					430		
Thr	Gly	Val	Asn	Glu	Gly	Gly	Leu	Lys	Val	Gly	Asp	Gly	Thr	Val	Val
		435					440					445			
Leu	Asn	Gln	Gln	Ala	Asp	Ser	Ser	Gly	His	Val	Gln	Ala	Phe	Ser	Ser
	450					455					460				
Val	Asn	Ile	Ala	Ser	Gly	Arg	Pro	Thr	Val	Val	Leu	Ala	Asp	Asn	Gln
465					470					475					480
Gln	Val	Asn	Pro	Asp	Asn	Ile	Ser	Trp	Gly	Tyr	Arg	Gly	Gly	Val	Leu
				485					490					495	
Asp	Val	Asn	Gly	Asn	Asp	Leu	Thr	Phe	His	Lys	Leu	Asn	Ala	Ala	Asp
			500					505					510		
Tyr	Gly	Ala	Thr	Leu	Gly	Asn	Ser	Ser	Asp	Lys	Thr	Ala	Asn	Ile	Thr
		515					520					525			
Leu	Asp	Tyr	Gln	Thr	Arg	Pro	Ala	Asp	Val	Lys	Val	Asn	Glu	Trp	Ser
	530					535					540				
Ser	Ser	Asn	Arg	Gly	Thr	Val	Gly	Ser	Leu	Tyr	Ile	Tyr	Asn	Asn	Pro
545					550					555					560
Tyr	Thr	His	Thr	Val	Asp	Tyr	Phe	Ile	Leu	Lys	Thr	Ser	Ser	Tyr	Gly
				565					570					575	
Trp	Phe	Pro	Thr	Gly	Gln	Val	Ser	Asn	Glu	His	Trp	Glu	Tyr	Val	Gly
			580					585					590		
His	Asp	Gln	Asn	Ser	Ala	Gln	Ala	Leu	Leu	Ala	Asn	Arg	Ile	Asn	Asn
		595					600					605			
Lys	Gly	Tyr	Leu	Tyr	His	Gly	Lys	Leu	Leu	Gly	Asn	Ile	Asn	Phe	Ser

610					615					620					
Asn	Lys	Ala	Thr	Pro	Gly	Thr	Thr	Gly	Ala	Leu	Val	Met	Asp	Gly	Ser
625					630					635					640
Ala	Asn	Met	Ser	Gly	Thr	Phe	Thr	Gln	Glu	Asn	Gly	Arg	Leu	Thr	Ile
				645					650					655	
Gln	Gly	His	Pro	Val	Ile	His	Ala	Ser	Thr	Ser	Gln	Ser	Ile	Ala	Asn
			660					665					670		
Thr	Val	Ser	Ser	Leu	Gly	Asp	Asn	Ser	Val	Leu	Thr	Gln	Pro	Thr	Ser
		675					680					685			
Phe	Thr	Gln	Asp	Asp	Trp	Glu	Asn	Arg	Thr	Phe	Ser	Phe	Gly	Ser	Leu
	690					695					700				
Val	Leu	Lys	Asp	Thr	Asp	Phe	Gly	Leu	Gly	Arg	Asn	Ala	Thr	Leu	Asn
705					710					715					720
Thr	Thr	Ile	Gln	Ala	Asp	Asn	Ser	Ser	Val	Thr	Leu	Gly	Asp	Ser	Arg
				725					730					735	
Val	Phe	Ile	Asp	Lys	Lys	Asp	Gly	Gln	Gly	Thr	Ala	Phe	Thr	Leu	Glu
			740					745					750		
Glu	Gly	Thr	Ser	Val	Ala	Thr	Lys	Asp	Ala	Asp	Lys	Ser	Val	Phe	Asn
	755						760					765			
Gly	Thr	Val	Asn	Leu	Asp	Asn	Gln	Ser	Val	Leu	Asn	Ile	Asn	Glu	Ile
	770					775					780				
Phe	Asn	Gly	Gly	Ile	Gln	Ala	Asn	Asn	Ser	Thr	Val	Asn	Ile	Ser	Ser
785					790					795					800
Asp	Ser	Ala	Val	Leu	Glu	Asn	Ser	Thr	Leu	Thr	Ser	Thr	Ala	Leu	Asn
				805					810					815	
Leu	Asn	Lys	Gly	Ala	Asn	Val	Leu	Ala	Ser	Gln	Ser	Phe	Val	Ser	Asp
			820					825					830		
Gly	Pro	Val	Asn	Ile	Ser	Asp	Ala	Thr	Leu	Ser	Leu	Asn	Ser	Arg	Pro
	835						840					845			

Asp Glu Val Ser His Thr Leu Leu Pro Val Tyr Asp Tyr Ala Gly Ser
850 855 860

Trp Asn Leu Lys Gly Asp Asp Ala Arg Leu Asn Val Gly Pro Tyr Ser
865 870 875 880

Met Leu Ser Gly Asn Ile Asn Val Gln Asp Lys Gly Thr Val Thr Leu
885 890 895

Gly Gly Glu Gly Glu Leu Ser Pro Asp Leu Thr Leu Gln Asn Gln Met
900 905 910

Leu Tyr Ser Leu Phe Asn Gly Tyr Arg Asn Thr Trp Ser Gly Ser Leu
915 920 925

Asn Ala Pro Asp Ala Thr Val Ser Met Thr Asp Thr Gln Trp Ser Met
930 935 940

Asn Gly Asn Ser Thr Ala Gly Asn Met Lys Leu Asn Arg Thr Ile Val
945 950 955 960

Gly Phe Asn Gly Gly Thr Ser Ser Phe Thr Thr Leu Thr Thr Asp Asn
965 970 975

Leu Asp Ala Val Gln Ser Ala Phe Val Met Arg Thr Asp Leu Asn Lys
980 985 990

Ala Asp Lys Leu Val Ile Asn Lys Ser Ala Thr Gly His Asp Asn Ser
995 1000 1005

Ile Trp Val Asn Phe Leu Lys Lys Pro Ser Asp Lys Asp Thr Leu
1010 1015 1020

Asp Ile Pro Leu Val Ser Ala Pro Glu Ala Thr Ala Asp Asn Leu
1025 1030 1035

Phe Arg Ala Ser Thr Arg Val Val Gly Phe Ser Asp Val Thr Pro
1040 1045 1050

Thr Leu Ser Val Arg Lys Glu Asp Gly Lys Lys Glu Trp Val Leu
1055 1060 1065

Asp Gly Tyr Gln Val Ala Arg Asn Asp Gly Gln Gly Lys Ala Ala
1070 1075 1080

Ala Thr Phe Met His Ile Ser Tyr Asn Asn Phe Ile Thr Glu Val
1085 1090 1095

Asn Asn Leu Asn Lys Arg Met Gly Asp Leu Arg Asp Ile Asn Gly
1100 1105 1110

Glu Ala Gly Thr Trp Val Arg Leu Leu Asn Gly Ser Gly Ser Ala
1115 1120 1125

Asp Gly Gly Phe Thr Asp His Tyr Thr Leu Leu Gln Met Gly Ala
1130 1135 1140

Asp Arg Lys His Glu Leu Gly Ser Met Asp Leu Phe Thr Gly Val
1145 1150 1155

Met Ala Thr Tyr Thr Asp Thr Asp Ala Ser Ala Gly Leu Tyr Ser
1160 1165 1170

Gly Lys Thr Lys Ser Trp Gly Gly Gly Phe Tyr Ala Ser Gly Leu
1175 1180 1185

Phe Arg Ser Gly Ala Tyr Phe Asp Leu Ile Ala Lys Tyr Ile His
1190 1195 1200

Asn Glu Asn Lys Tyr Asp Leu Asn Phe Ala Gly Ala Gly Lys Gln
1205 1210 1215

Asn Phe Arg Ser His Ser Leu Tyr Ala Gly Ala Glu Val Gly Tyr
1220 1225 1230

Arg Tyr His Leu Thr Asp Thr Thr Phe Val Glu Pro Gln Ala Glu
1235 1240 1245

Leu Val Trp Gly Arg Leu Gln Gly Gln Thr Phe Asn Trp Asn Asp
1250 1255 1260

Ser Gly Met Asp Val Ser Met Arg Arg Asn Ser Val Asn Pro Leu
1265 1270 1275

Val Gly Arg Thr Gly Val Val Ser Gly Lys Thr Phe Ser Gly Lys
1280 1285 1290

Asp Trp Ser Leu Thr Ala Arg Ala Gly Leu His Tyr Glu Phe Asp
1295 1300 1305

Leu Thr Asp Ser Ala Asp Val His Leu Lys Asp Ala Ala Gly Glu
1310 1315 1320

His Gln Ile Asn Gly Arg Lys Asp Gly Arg Met Leu Tyr Gly Val
1325 1330 1335

Gly Leu Asn Ala Arg Phe Gly Asp Asn Thr Arg Leu Gly Leu Glu
1340 1345 1350

Val Glu Arg Ser Ala Phe Gly Lys Tyr Asn Thr Asp Asp Ala Ile
1355 1360 1365

Asn Ala Asn Ile Arg Tyr Ser Phe
1370 1375

<210> 27

<211> 349

<212> PRT

<213> Escherichia coli

<400> 27

Met Ile Thr Leu Phe Arg Leu Leu Ala Ile Leu Cys Leu Phe Phe Asn
1 5 10 15

Val Ser Ala Phe Ala Val Asp Cys Tyr Gln Asp Gly Tyr Arg Gly Thr
20 25 30

Thr Leu Ile Asn Gly Asp Leu Pro Thr Phe Lys Ile Pro Glu Asn Ala
35 40 45

Gln Pro Gly Gln Lys Ile Trp Glu Ser Gly Asp Ile Asn Ile Thr Val
50 55 60

Tyr Cys Asp Asn Ala Pro Gly Trp Ser Ser Asn Asn Pro Ser Glu Asn
65 70 75 80

Val Tyr Ala Trp Ile Lys Leu Pro Gln Ile Asn Ser Ala Asp Met Leu

				85				90				95			
Asn	Asn	Pro	Tyr 100	Leu	Thr	Phe	Gly	Val 105	Thr	Tyr	Asn	Gly	Val 110	Asp	Tyr
Glu	Gly	Thr 115	Asn	Glu	Lys	Ile	Asp 120	Thr	His	Ala	Cys	Leu 125	Asp	Lys	Tyr
Glu	Gln 130	Tyr	Tyr	Asn	Gly	Tyr 135	Tyr	His	Asp	Pro	Val 140	Cys	Asn	Gly	Ser
Thr 145	Leu	Gln	Lys	Asn	Val 150	Thr	Phe	Asn	Ala	His 155	Phe	Arg	Val	Tyr	Val 160
Lys	Phe	Lys	Ser 165	Arg	Pro	Ala	Gly	Asp 170	Gln	Thr	Val	Asn	Phe	Gly 175	Thr
Val	Asn	Val	Leu 180	Gln	Phe	Asp	Gly	Glu 185	Gly	Gly	Ala	Asn	Met 190	Ala	Pro
Asn	Ala 195	Lys	Asn	Leu	Arg	Tyr	Ala 200	Ile	Thr	Gly	Leu	Asp 205	Asn	Ile	Ser
Phe 210	Leu	Asp	Cys	Ser	Val	Asp 215	Val	Arg	Ile	Ser	Pro 220	Glu	Ser	Gln	Ile
Val 225	Asn	Phe	Gly	Gln	Ile 230	Ala	Ala	Asn	Ser	Ile 235	Ala	Thr	Phe	Pro	Pro 240
Lys	Ala	Ala	Phe 245	Ser	Val	Ser	Thr	Ile 250	Lys	Asp	Ile	Ala	Ser	Asp 255	Cys
Thr	Glu	Gln	Phe 260	Asp	Val	Ala	Thr	Ser 265	Phe	Phe	Thr	Ser	Asp 270	Thr	Leu
Tyr	Asp 275	Asn	Thr	His	Leu	Glu	Ile 280	Gly	Asn	Gly	Leu	Leu 285	Met	Arg	Ile
Thr	Asp 290	Gln	Lys	Thr	Gln	Glu 295	Asp	Ile	Lys	Phe	Asn 300	Gln	Phe	Lys	Leu
Phe 305	Ser	Thr	Tyr	Ile	Pro 310	Gly	Gln	Ser	Ala	Ala 315	Met	Ala	Thr	Arg	Asp 320

Tyr Gln Ala Glu Leu Thr Gln Lys Pro Gly Glu Pro Leu Val Tyr Gly
325 330 335

Pro Phe Gln Lys Asp Leu Ile Val Lys Ile Asn Tyr His
340 345

<210> 28

<211> 840

<212> PRT

<213> Escherichia coli

<400> 28

Met Asn Asn Lys Asn Thr Phe Ser Arg Asp Lys Leu Ser His Ala Ile
1 5 10 15

Lys Asn Ala Leu Ser Gly Val Val Cys Ser Leu Leu Phe Val Leu Pro
20 25 30

Val His Ala Val Glu Phe Asn Val Asp Met Ile Asp Ala Glu Asp Arg
35 40 45

Glu Asn Ile Asp Ile Ser Arg Phe Glu Lys Lys Gly Tyr Ile Pro Pro
50 55 60

Gly Arg Tyr Leu Val Arg Val Gln Ile Asn Lys Asn Met Leu Pro Gln
65 70 75 80

Thr Leu Ile Leu Glu Trp Val Lys Ala Asp Asn Glu Ser Gly Ser Leu
85 90 95

Leu Cys Leu Thr Lys Glu Asn Leu Thr Asn Phe Gly Leu Asn Thr Glu
100 105 110

Phe Ile Glu Ser Leu Gln Asn Ile Ala Gly Ser Glu Cys Leu Asp Leu
115 120 125

Ser Gln Arg Gln Glu Leu Thr Thr Arg Leu Asp Lys Ala Thr Met Ile
130 135 140

Leu Ser Leu Ser Val Pro Gln Ala Trp Leu Lys Tyr Gln Ala Thr Asn
145 150 155 160

Trp Thr Pro Pro Glu Phe Trp Asp Thr Gly Ile Thr Gly Phe Ile Leu
165 170 175

Asp Tyr Asn Val Tyr Ala Ser Gln Tyr Ala Pro His His Gly Asp Ser
180 185 190

Thr Gln Asn Val Ser Ser Tyr Gly Thr Leu Gly Phe Asn Leu Gly Ala
195 200 205

Trp Arg Leu Arg Ser Asp Tyr Gln Tyr Asn Gln Asn Phe Ala Asp Gly
210 215 220

Arg Ser Val Asn Arg Asp Ser Glu Phe Ala Arg Thr Tyr Leu Phe Arg
225 230 235 240

Pro Ile Pro Ser Trp Ser Ser Lys Phe Thr Met Gly Gln Tyr Asp Leu
245 250 255

Ser Ser Asn Leu Tyr Asp Thr Phe His Phe Thr Gly Ala Ser Leu Glu
260 265 270

Ser Asp Glu Ser Met Leu Pro Pro Asp Leu Gln Gly Tyr Ala Pro Gln
275 280 285

Ile Thr Gly Ile Ala Gln Thr Asn Ala Lys Val Thr Val Ala Gln Asn
290 295 300

Gly Arg Val Leu Tyr Gln Thr Thr Val Ala Pro Gly Pro Phe Thr Ile
305 310 315 320

Ser Asp Leu Gly Gln Ser Phe Gln Gly Gln Leu Asp Val Thr Val Glu
325 330 335

Glu Glu Asp Gly Arg Thr Ser Thr Phe Gln Val Gly Ser Ala Ser Ile
340 345 350

Pro Tyr Leu Thr Arg Lys Gly Gln Val Arg Tyr Lys Thr Ser Leu Gly
355 360 365

Lys Pro Thr Ser Val Gly His Asn Asp Ile Asn Asn Pro Phe Phe Trp
370 375 380

Thr Ala Glu Ala Ser Trp Gly Trp Leu Asn Asn Val Ser Leu Tyr Gly

385				390				395				400				
Gly	Gly	Met	Phe	Thr	Ala	Asp	Asp	Tyr	Gln	Ala	Ile	Thr	Thr	Gly	Ile	
				405					410					415		
Gly	Phe	Asn	Leu	Asn	Gln	Phe	Gly	Ser	Leu	Ser	Phe	Asp	Val	Thr	Gly	
				420					425					430		
Ala	Asp	Ala	Ser	Leu	Gln	Gln	Gln	Asn	Ser	Gly	Asn	Leu	Arg	Gly	Tyr	
				435					440					445		
Ser	Tyr	Arg	Phe	Asn	Tyr	Ala	Lys	His	Phe	Glu	Ser	Thr	Gly	Ser	Gln	
				450					455					460		
Ile	Thr	Phe	Ala	Gly	Tyr	Arg	Phe	Ser	Asp	Lys	Asp	Tyr	Val	Ser	Met	
465				470				475				480				
Ser	Glu	Tyr	Leu	Ser	Ser	Arg	Asn	Gly	Asp	Glu	Ser	Ile	Asp	Asn	Glu	
				485					490					495		
Lys	Glu	Ser	Tyr	Val	Ile	Ser	Leu	Asn	Gln	Tyr	Phe	Glu	Thr	Leu	Glu	
				500					505					510		
Leu	Asn	Ser	Tyr	Leu	Asn	Val	Thr	Arg	Asn	Thr	Tyr	Trp	Asp	Ser	Ala	
				515					520					525		
Ser	Asn	Thr	Asn	Tyr	Ser	Val	Ser	Val	Ser	Lys	Asn	Phe	Asp	Ile	Gly	
				530					535					540		
Asp	Phe	Lys	Gly	Ile	Ser	Ala	Ser	Leu	Ala	Val	Ser	Arg	Ile	Arg	Trp	
545				550				555				560				
Asp	Asp	Asp	Glu	Glu	Asn	Gln	Tyr	Tyr	Phe	Ser	Phe	Ser	Leu	Pro	Leu	
				565					570					575		
Gln	Gln	Asn	Arg	Asn	Ile	Ser	Tyr	Ser	Met	Gln	Arg	Thr	Gly	Ser	Ser	
				580					585					590		
Asn	Thr	Ser	Gln	Met	Ile	Ser	Trp	Tyr	Asp	Ser	Ser	Asp	Arg	Asn	Asn	
				595					600					605		
Ile	Trp	Asn	Ile	Ser	Ala	Ser	Ala	Thr	Asp	Asp	Asn	Ile	Arg	Asp	Gly	

610		615		620															
Glu	Pro	Thr	Leu	Arg	Gly	Ser	Tyr	Gln	His	Tyr	Ser	Pro	Trp	Gly	Arg				
625					630					635					640				
Leu	Asn	Ile	Asn	Gly	Ser	Val	Gln	Pro	Asn	Gln	Tyr	Asn	Ser	Val	Thr				
				645					650					655					
Ala	Gly	Trp	Tyr	Gly	Ser	Leu	Thr	Ala	Thr	Arg	His	Gly	Val	Ala	Leu				
				660				665					670						
His	Asp	Tyr	Ser	Tyr	Gly	Asp	Asn	Ala	Arg	Met	Met	Val	Asp	Thr	Asp				
		675					680					685							
Gly	Ile	Ser	Gly	Ile	Glu	Ile	Asn	Ser	Asn	Arg	Thr	Val	Thr	Asn	Gly				
	690					695					700								
Leu	Gly	Ile	Ala	Val	Ile	Pro	Ser	Leu	Ser	Asn	Tyr	Thr	Thr	Ser	Met				
705					710					715					720				
Leu	Arg	Val	Asn	Asn	Asn	Asp	Leu	Pro	Glu	Gly	Val	Asp	Val	Glu	Asn				
				725					730					735					
Ser	Val	Ile	Arg	Thr	Thr	Leu	Thr	Gln	Gly	Ala	Ile	Gly	Tyr	Ala	Lys				
			740					745					750						
Leu	Asn	Ala	Thr	Thr	Gly	Tyr	Gln	Ile	Val	Gly	Val	Ile	Arg	Gln	Glu				
		755					760					765							
Asn	Gly	Arg	Phe	Pro	Pro	Leu	Gly	Val	Asn	Val	Thr	Asp	Lys	Ala	Thr				
	770					775					780								
Gly	Lys	Asp	Val	Gly	Leu	Val	Ala	Glu	Asp	Gly	Phe	Val	Tyr	Leu	Ser				
785					790					795					800				
Gly	Ile	Gln	Glu	Asn	Ser	Ile	Leu	His	Leu	Thr	Trp	Gly	Asp	Asn	Thr				
				805					810					815					
Cys	Glu	Val	Thr	Pro	Pro	Asn	Gln	Ser	Asn	Ile	Ser	Glu	Ser	Ala	Ile				
			820					825						830					
Ile	Leu	Pro	Cys	Lys	Thr	Val	Lys												
		835					840												

<210> 29
<211> 169
<212> PRT
<213> Escherichia coli

<400> 29
Leu Met Asn Thr Lys Gln Ser Val Ala Gln Leu Ala Val Pro His Arg
1 5 10 15

Lys Arg Leu Ser Ser Thr Met Val Val Ala Leu Leu Leu Cys Val Val
20 25 30

Ala Gly Ala Val Met Ile Asn Ala Ala Asp Phe Pro Ala Thr Ala Ile
35 40 45

Glu Thr Asp Pro Gly Ala Ser Ala Phe Pro Thr Phe Tyr Ala Cys Ala
50 55 60

Leu Ile Val Leu Ala Val Leu Leu Val Ile Arg Asp Leu Leu Gln Ala
65 70 75 80

Lys Pro Ala Ser Cys Ala Asn Ala Gln Glu Lys Pro Ala Phe Arg Lys
85 90 95

Thr Ala Thr Gly Ile Ala Ala Thr Ala Phe Tyr Ile Val Ala Met Ser
100 105 110

Tyr Cys Gly Tyr Leu Ile Thr Thr Pro Val Phe Leu Ile Val Ile Met
115 120 125

Thr Leu Met Gly Tyr Arg Arg Trp Val Leu Thr Pro Gly Ile Ala Leu
130 135 140

Leu Leu Thr Ala Ile Leu Trp Leu Leu Phe Val Glu Ala Leu Gln Val
145 150 155 160

Pro Leu Pro Val Gly Thr Phe Phe Glu
165

<210> 30
<211> 311
<212> PRT
<213> Escherichia coli

<400> 30

Met Val Leu Leu Ala Gly Ala Ala Leu Ser Ile Ala Pro Val Gln Ala
1 5 10 15

Ala Ser Tyr Pro Thr Lys Gln Ile Glu Leu Val Val Pro Tyr Ala Ala
20 25 30

Gly Gly Gly Thr Asp Leu Val Ala Arg Ala Phe Ala Asp Ala Ala Lys
35 40 45

Asn His Leu Pro Val Ser Ile Gly Val Ile Asn Lys Pro Gly Gly Gly
50 55 60

Gly Ala Ile Gly Leu Ser Glu Ile Ala Ala Ala Arg Pro Asn Gly Tyr
65 70 75 80

Lys Ile Gly Leu Gly Thr Val Glu Leu Thr Thr Leu Pro Ser Leu Gly
85 90 95

Met Val Arg Phe Lys Thr Ser Asp Phe Lys Pro Ile Ala Arg Leu Asn
100 105 110

Ala Asp Pro Ala Ala Ile Thr Val Arg Ala Asp Ala Pro Trp Asn Ser
115 120 125

Tyr Glu Glu Phe Met Ala Tyr Ser Lys Ala Asn Pro Gly Lys Val Arg
130 135 140

Ile Gly Asn Ser Gly Thr Gly Ala Ile Trp His Leu Ala Ala Ala Ala
145 150 155 160

Leu Glu Asp Lys Thr Gly Thr Lys Phe Ser His Val Pro Tyr Asp Gly
165 170 175

Ala Ala Pro Ala Ile Thr Gly Leu Leu Gly Gly His Ile Glu Ala Val
180 185 190

Ser Val Ser Pro Gly Glu Val Ile Asn His Val Asn Gly Gly Lys Leu
195 200 205

Lys Thr Leu Val Val Met Ala Asp Glu Arg Met Lys Thr Met Pro Asp
210 215 220

Val Pro Thr Leu Lys Glu Lys Gly Val Asp Leu Ser Ile Gly Thr Trp
225 230 235 240

Arg Gly Leu Ile Val Ser Gln Lys Thr Pro Gln Asp Val Val Asp Val
245 250 255

Leu Ala Lys Ala Ala Lys Glu Thr Ala Glu Glu Pro Ala Phe Gln Asp
260 265 270

Ala Leu Gln Lys Leu Asn Leu Asn Tyr Ala Trp Leu Asp Ala Ala Ser
275 280 285

Phe Gln Thr Gln Ile Ser Glu Gln Glu Lys Tyr Phe Asp Glu Leu Leu
290 295 300

Thr Arg Leu Gly Leu Lys Lys
305 310

<210> 31

<211> 722

<212> PRT

<213> Escherichia coli

<400> 31

Met Leu Arg Trp Lys Arg Cys Ile Ile Leu Thr Phe Ile Ser Gly Ala
1 5 10 15

Ala Phe Ala Ala Pro Glu Ile Asn Val Lys Gln Asn Glu Ser Leu Pro
20 25 30

Asp Leu Gly Ser Gln Ala Ala Gln Gln Asp Glu Gln Thr Asn Lys Gly
35 40 45

Lys Ser Leu Lys Glu Arg Gly Ala Asp Tyr Val Ile Asn Ser Ala Thr
50 55 60

Gln Gly Phe Glu Asn Leu Thr Pro Glu Ala Leu Glu Ser Gln Ala Arg
65 70 75 80

Ser Tyr Leu Gln Ser Gln Ile Thr Ser Thr Ala Gln Ser Tyr Ile Glu
85 90 95

Asp Thr Leu Ser Pro Tyr Gly Lys Val Arg Leu Asn Leu Ser Ile Gly

100					105					110					
Gln	Gly	Gly	Asp	Leu	Asp	Gly	Ser	Ser	Ile	Asp	Tyr	Phe	Val	Pro	Trp
		115					120					125			
Tyr	Asp	Asn	Gln	Thr	Thr	Val	Tyr	Phe	Ser	Gln	Phe	Ser	Ala	Gln	Arg
	130					135					140				
Lys	Glu	Asp	Arg	Thr	Ile	Gly	Asn	Ile	Gly	Leu	Gly	Val	Arg	Tyr	Asn
145					150					155					160
Phe	Asp	Lys	Tyr	Leu	Leu	Gly	Gly	Asn	Ile	Phe	Tyr	Asp	Tyr	Asp	Phe
				165					170					175	
Thr	Arg	Gly	His	Arg	Arg	Leu	Gly	Leu	Gly	Ala	Glu	Ala	Trp	Thr	Asp
			180					185					190		
Tyr	Leu	Lys	Phe	Ser	Gly	Asn	Tyr	Tyr	His	Pro	Leu	Ser	Asp	Trp	Lys
		195					200					205			
Asp	Ser	Glu	Asp	Phe	Asp	Phe	Tyr	Glu	Glu	Arg	Pro	Ala	Arg	Gly	Trp
	210					215					220				
Asp	Ile	Arg	Ala	Glu	Val	Trp	Leu	Pro	Ser	Tyr	Pro	Gln	Leu	Gly	Gly
225					230					235					240
Lys	Ile	Val	Phe	Glu	Gln	Tyr	Tyr	Gly	Asp	Glu	Val	Ala	Leu	Phe	Gly
				245					250					255	
Thr	Asp	Asn	Leu	Glu	Lys	Asp	Pro	Tyr	Ala	Val	Thr	Leu	Gly	Leu	Asn
			260					265					270		
Tyr	Gln	Pro	Val	Pro	Leu	Leu	Thr	Val	Gly	Thr	Asp	Tyr	Lys	Ala	Gly
		275					280					285			
Thr	Gly	Asp	Asn	Ser	Asp	Val	Ser	Ile	Asn	Ala	Thr	Leu	Asn	Tyr	Gln
	290					295					300				
Phe	Gly	Val	Pro	Leu	Lys	Asp	Gln	Leu	Asp	Ser	Asp	Lys	Val	Lys	Ala
305					310					315					320
Ala	His	Ser	Leu	Met	Gly	Ser	Arg	Leu	Asp	Phe	Val	Glu	Arg	Asn	Asn
				325				330						335	

Phe Ile Val Leu Glu Tyr Lys Glu Lys Asp Pro Leu Asp Val Thr Leu
340 345 350

Trp Leu Lys Ala Asp Ala Thr Asn Glu His Pro Glu Cys Val Ile Lys
355 360 365

Asp Thr Pro Glu Ala Ala Val Gly Leu Glu Lys Cys Lys Trp Thr Ile
370 375 380

Asn Ala Leu Ile Asn His His Tyr Lys Ile Val Ala Ala Ser Trp Gln
385 390 395 400

Ala Lys Asn Asn Ala Ala Arg Thr Leu Val Met Pro Val Ile Lys Glu
405 410 415

Asn Thr Leu Thr Glu Gly Asn Asn Asn His Trp Asn Leu Val Leu Pro
420 425 430

Ala Trp Gln Tyr Ser Ser Asp Gln Ala Glu Gln Glu Lys Leu Asn Thr
435 440 445

Trp Arg Val Arg Leu Ala Leu Glu Asp Glu Lys Gly Asn Arg Gln Asn
450 455 460

Ser Gly Val Val Glu Ile Thr Val Gln Gln Asp Arg Lys Ile Glu Leu
465 470 475 480

Ile Val Asn Asn Ile Ala Asn Pro Glu Glu Asn Asn His Ser His Glu
485 490 495

Ala Ser Ala Gln Ala Asp Gly Val Asp Gly Val Val Met Asp Leu Asp
500 505 510

Val Thr Asp Ser Phe Gly Asp Asn Thr Asp Arg Asn Gly Asp Ala Leu
515 520 525

Pro Glu Asp Asn Leu Thr Pro Gln Leu Tyr Asp Ala Gln Asp Lys Arg
530 535 540

Val Thr Leu Thr Asn Lys Pro Cys Ser Thr Asp Asn Pro Cys Val Phe
545 550 555 560

Ile Ala Lys Gln Asp Lys Glu Lys Gly Thr Val Thr Leu Ser Ser Thr
565 570 575

Leu Pro Gly Thr Tyr Arg Trp Lys Ala Lys Ala Ala Pro Tyr Asp Asp
580 585 590

Ser Asn Tyr Val Asp Val Thr Phe Leu Gly Ala Glu Ile Gly Gly Leu
595 600 605

Asn Ala Phe Ile Tyr Arg Val Gly Ala Ala Lys Pro Ser Asn Leu Ile
610 615 620

Gly Lys Asp Lys Glu Pro Leu Pro Ser Thr Thr Phe Ile Asp Leu Phe
625 630 635 640

Tyr Gly Ala Thr Thr Ile Lys Thr Val Ser Ser Ser Arg Ser Lys Asn
645 650 655

Leu Thr Lys Arg Trp Cys Ser Thr Thr Thr Ser Gly Asn Leu Pro Ala
660 665 670

Arg Ala Ser Met Val Ser Gly Cys Thr Gly Glu His Ser Asn Glu Asp
675 680 685

Ile Val Ile Pro Ala Thr Asn Arg Glu Ala Ala Gln Thr Tyr Gly Ala
690 695 700

Gln Ala Gly Asp Gly Leu Gln Gly Tyr Gly Leu Arg Val Leu Tyr Thr
705 710 715 720

Lys Lys

<210> 32

<211> 319

<212> PRT

<213> Escherichia coli

<400> 32

Met Lys Gln Asp Lys Arg Arg Gly Leu Thr Arg Ile Ala Leu Ala Leu
1 5 10 15

Ala Leu Ala Gly Tyr Cys Val Ala Pro Val Ala Leu Ala Glu Asp Ser

20	25	30
Ala Trp Val Asp Ser Gly Glu Thr Asn Ile Phe Gln Gly Thr Ile Pro		
35	40	45
Trp Leu Tyr Ser Glu Gly Gly Ser Ala Thr Thr Asp Ala Asp Arg Val		
50	55	60
Thr Leu Thr Ser Asp Leu Lys Gly Ala Arg Pro Gln Gly Met Lys Arg		
65	70	75
Thr Ser Val Phe Thr Arg Val Ile Asn Ile Gly Asp Thr Glu Gly Asp		
85	90	95
Val Asp Leu Gly Gly Leu Gly Asp Asn Ala Lys Thr Ile Asp Thr Ile		
100	105	110
Arg Trp Met Ser Tyr Lys Asp Ala Gln Gly Gly Asp Pro Lys Glu Leu		
115	120	125
Ala Thr Lys Val Thr Ser Tyr Thr Leu Thr Asp Ala Asp Arg Gly Arg		
130	135	140
Tyr Ile Gly Ile Glu Ile Thr Pro Thr Thr Gln Thr Gly Thr Pro Asn		
145	150	155
Val Gly Thr Ala Leu His Leu Tyr Asp Val Ser Thr Ala Ser Gly Gly		
165	170	175
Gly Ser Asp Ser Asp Asn Val Ala Pro Gly Pro Val Val Asn Gln Asn		
180	185	190
Leu Lys Val Ala Ile Phe Val Asp Gly Thr Ser Ile Asn Leu Ile Asn		
195	200	205
Gly Ser Thr Pro Ile Glu Leu Gly Lys Thr Tyr Val Ala Lys Leu Tyr		
210	215	220
Ser Asp Glu Asn Lys Asn Gly Lys Phe Asp Ala Gly Thr Asp Ala Asp		
225	230	235
Val Thr Ala Asn Tyr Asp Phe Arg Trp Val Leu Ser Gly Ser Ser Gln		

	245		250		255										
Gln	Leu	Gly	Thr	Ser	Gly	Gly	Ile	Val	Asn	Ser	Ser	Phe	Asp	Asn	Asn
			260					265					270		
Asn	Leu	Val	Ile	Pro	Ala	Thr	Asn	Asp	Glu	Ala	Arg	Thr	Asn	Leu	Asn
		275					280					285			
Gly	Pro	Ala	Arg	Asp	Gly	Lys	Glu	Ala	Leu	Ser	Ile	Pro	Thr	Asn	Gly
	290					295					300				
Asp	Gly	Val	Gln	Gly	Tyr	Lys	Leu	His	Ile	Ile	Tyr	Lys	His	Lys	
305					310					315					
<210> 33															
<211> 629															
<212> PRT															
<213> Escherichia coli															
<400> 33															
Met	Lys	Lys	Val	Leu	Thr	Leu	Ser	Leu	Leu	Ala	Leu	Cys	Val	Ser	His
1			5					10					15		
Ser	Ala	Val	Ala	Ala	Asn	Tyr	Thr	Phe	Asn	Asn	Asp	Asn	Ile	Ala	Leu
			20					25					30		
Ser	Phe	Asp	Asp	Thr	Asn	Ser	Thr	Ile	Val	Leu	Lys	Asp	Arg	Arg	Thr
		35					40					45			
Asn	His	Pro	Ile	Thr	Pro	Gln	Glu	Leu	Phe	Phe	Leu	Thr	Leu	Pro	Asp
	50					55					60				
Glu	Thr	Lys	Ile	His	Thr	Ala	Asp	Phe	Lys	Ile	Lys	His	Ile	Lys	Lys
65					70					75				80	
Gln	Asp	Asn	Ala	Ile	Val	Ile	Asp	Phe	Thr	Arg	Pro	Asp	Phe	Asn	Val
				85					90					95	
Thr	Val	Gln	Leu	Asn	Leu	Val	Lys	Gly	Lys	Tyr	Ala	Ser	Ile	Asp	Tyr
		100						105					110		
Thr	Ile	Ala	Ala	Val	Gly	Gln	Pro	Arg	Asp	Val	Ala	Lys	Ile	Thr	Phe
		115					120					125			

Phe Pro Thr Lys Lys Gln Phe Gln Ala Pro Tyr Val Asp Gly Ala Ile
130 135 140

Thr Ser Ser Pro Ile Ile Ala Asp Ser Phe Phe Ile Leu Pro Asn Lys
145 150 155 160

Pro Ile Val Asn Thr Tyr Ala Tyr Glu Ala Thr Thr Asn Leu Asn Val
165 170 175

Glu Leu Lys Thr Pro Ile Gln Pro Glu Thr Pro Val Ser Phe Thr Thr
180 185 190

Trp Phe Gly Thr Phe Pro Glu Thr Ser Gln Leu Arg Arg Ser Val Asn
195 200 205

Gln Phe Ile Asn Ala Val Arg Pro Arg Pro Tyr Lys Pro Tyr Leu His
210 215 220

Tyr Asn Ser Trp Met Asp Ile Gly Phe Phe Thr Pro Tyr Thr Glu Gln
225 230 235 240

Asp Val Leu Gly Arg Met Asp Glu Trp Asn Lys Glu Phe Ile Ser Gly
245 250 255

Arg Gly Val Ala Leu Asp Ala Phe Leu Leu Asp Asp Gly Trp Asp Asp
260 265 270

Leu Thr Gly Arg Trp Leu Phe Gly Pro Ala Phe Ser Asn Gly Phe Ser
275 280 285

Lys Val Arg Glu Lys Ala Asp Ser Leu His Ser Ser Val Gly Leu Trp
290 295 300

Leu Ser Pro Trp Gly Gly Tyr Asn Lys Pro Gln Arg Arg Ser Arg Phe
305 310 315 320

Ala Cys Lys Arg Val Trp Val Arg Asn Arg Gly Arg Gln Ala Gly Ala
325 330 335

Phe Gly Ser Glu Leu Leu Lys Asn Phe Asn Glu Gln Ile Ile Asn Leu
340 345 350

Ile Lys Asn Glu His Ile Thr Ser Phe Lys Leu Asp Gly Met Gly Asn

355							360									365
Ala	Ser	Ser	His	Ile	Lys	Gly	Ser	Pro	Phe	Ala	Ser	Asp	Phe	Asp	Ala	
370						375					380					
Ser	Ile	Ala	Leu	Leu	His	Asn	Met	Arg	Arg	Ala	Asn	Pro	Asn	Leu	Phe	
385					390					395					400	
Ile	Asn	Leu	Thr	Thr	Gly	Thr	Asn	Ala	Ser	Pro	Ser	Trp	Leu	Phe	Tyr	
				405					410					415		
Ala	Asp	Ser	Ile	Trp	Arg	Gln	Gly	Asp	Asp	Ile	Asn	Leu	Tyr	Gly	Pro	
			420					425					430			
Gly	Thr	Pro	Val	Gln	Gln	Trp	Ile	Thr	Tyr	Arg	Asp	Ala	Glu	Thr	Tyr	
		435					440					445				
Arg	Ser	Ile	Val	Arg	Lys	Gly	Pro	Leu	Phe	Pro	Leu	Asn	Ser	Leu	Met	
	450					455					460					
Tyr	His	Gly	Ile	Val	Ser	Ala	Glu	Asn	Ala	Tyr	Tyr	Gly	Leu	Glu	Lys	
465					470					475					480	
Val	Gln	Thr	Asp	Ser	Asp	Phe	Ala	Asp	Gln	Val	Trp	Ser	Tyr	Phe	Ala	
				485					490					495		
Thr	Gly	Thr	Gln	Leu	Gln	Glu	Leu	Tyr	Ile	Thr	Pro	Ser	Met	Leu	Asn	
			500					505					510			
Lys	Val	Lys	Trp	Asp	Thr	Leu	Ala	Lys	Ala	Ala	Lys	Trp	Ser	Lys	Glu	
		515					520					525				
Asn	Ala	Ser	Val	Leu	Val	Asp	Thr	His	Trp	Ile	Gly	Gly	Asp	Pro	Thr	
	530					535					540					
Ala	Leu	Ala	Val	Tyr	Gly	Trp	Ala	Ser	Trp	Ser	Lys	Asp	Lys	Ala	Ile	
545					550					555					560	
Leu	Gly	Leu	Arg	Asn	Pro	Ser	Asp	Lys	Pro	Gln	Thr	Tyr	Tyr	Leu	Asp	
				565					570					575		
Leu	Ala	Lys	Asp	Phe	Glu	Ile	Pro	Ala	Gly	Asn	Ala	Ala	Gln	Phe	Ser	

580

585

590

Leu Lys Ala Val Tyr Gly Ser Asn Lys Thr Val Pro Val Glu Tyr Lys
 595 600 605

Asn Ala Thr Val Ile Thr Leu Gln Pro Leu Glu Thr Leu Val Phe Glu
 610 615 620

Ala Val Thr Ile Asn
 625

<210> 34

<211> 1778

<212> PRT

<213> Escherichia coli

<400> 34

Met Asn Lys Ile Phe Lys Val Ile Trp Asn Pro Ala Thr Gly Ser Tyr
 1 5 10 15

Thr Val Ala Ser Glu Thr Ala Lys Ser Arg Gly Lys Lys Ser Gly Arg
 20 25 30

Ser Lys Leu Leu Ile Ser Ala Leu Val Ala Gly Gly Leu Leu Ser Ser
 35 40 45

Phe Gly Ala Ser Ala Asp Asn Tyr Thr Gly Gln Pro Thr Asp Tyr Gly
 50 55 60

Asp Gly Ser Ala Gly Asp Gly Trp Val Ala Ile Gly Lys Gly Ala Lys
 65 70 75 80

Ala Asn Thr Phe Met Asn Thr Ser Gly Ala Ser Thr Ala Leu Gly Tyr
 85 90 95

Asp Ala Ile Ala Glu Gly Glu Tyr Ser Ser Ala Ile Gly Ser Lys Thr
 100 105 110

Leu Ala Thr Gly Gly Ala Ser Met Ala Phe Gly Val Ser Ala Lys Ala
 115 120 125

Met Gly Asp Arg Ser Val Ala Leu Gly Ala Ser Ser Val Ala Asn Gly
 130 135 140

Asp Arg Ser Met Ala Phe Gly Arg Tyr Ala Lys Thr Asn Gly Phe Thr
145 150 155 160

Ser Leu Ala Ile Gly Asp Ser Ser Leu Ala Asp Gly Glu Lys Thr Ile
165 170 175

Ala Leu Gly Asn Thr Ala Lys Ala Tyr Glu Ile Met Ser Ile Ala Leu
180 185 190

Gly Asp Asn Ala Asn Ala Ser Lys Glu Tyr Ala Met Ala Leu Gly Ala
195 200 205

Ser Ser Lys Ala Gly Gly Ala Asp Ser Leu Ala Phe Gly Arg Lys Ser
210 215 220

Thr Ala Asn Ser Thr Gly Ser Leu Ala Ile Gly Ala Asp Ser Ser Ser
225 230 235 240

Ser Asn Asp Asn Ala Ile Ala Ile Gly Asn Lys Thr Gln Ala Leu Gly
245 250 255

Val Asn Ser Met Ala Leu Gly Asn Ala Ser Gln Ala Ser Gly Glu Ser
260 265 270

Ser Ile Ala Leu Gly Asn Thr Ser Glu Ala Ser Glu Gln Asn Ala Ile
275 280 285

Ala Leu Gly Gln Gly Ser Ile Ala Ser Lys Val Asn Ser Ile Ala Leu
290 295 300

Gly Ser Asn Ser Leu Ser Ser Gly Glu Asn Ala Ile Ala Leu Gly Glu
305 310 315 320

Gly Ser Ala Ala Gly Gly Ser Asn Ser Leu Ala Phe Gly Ser Gln Ser
325 330 335

Arg Ala Asn Gly Asn Asp Ser Val Ala Ile Gly Val Gly Ala Ala Ala
340 345 350

Ala Thr Asp Asn Ser Val Ala Ile Gly Ala Gly Ser Thr Thr Asp Ala
355 360 365

Ser Asn Thr Val Ser Val Gly Asn Ser Ala Thr Lys Arg Lys Ile Val

370						375										380
Asn	Met	Ala	Ala	Gly	Ala	Ile	Ser	Asn	Thr	Ser	Thr	Asp	Ala	Ile	Asn	
385					390					395					400	
Gly	Ser	Gln	Leu	Tyr	Thr	Ile	Ser	Asp	Ser	Val	Ala	Lys	Arg	Leu	Gly	
				405					410					415		
Gly	Gly	Ala	Thr	Val	Gly	Ser	Asp	Gly	Thr	Val	Thr	Ala	Val	Ser	Tyr	
			420					425					430			
Ala	Leu	Arg	Ser	Gly	Thr	Tyr	Asn	Asn	Val	Gly	Asp	Ala	Leu	Ser	Gly	
		435					440					445				
Ile	Asp	Asn	Asn	Thr	Leu	Gln	Trp	Asn	Lys	Thr	Ala	Gly	Ala	Phe	Ser	
	450					455					460					
Ala	Asn	His	Gly	Ala	Asn	Ala	Thr	Asn	Lys	Ile	Thr	Asn	Val	Ala	Lys	
465					470					475					480	
Gly	Thr	Val	Ser	Ala	Thr	Ser	Thr	Asp	Val	Val	Asn	Gly	Ser	Gln	Leu	
				485					490					495		
Tyr	Asp	Leu	Gln	Gln	Asp	Ala	Leu	Leu	Trp	Asn	Gly	Thr	Ala	Phe	Ser	
		500						505					510			
Ala	Ala	His	Gly	Thr	Glu	Ala	Thr	Ser	Lys	Ile	Thr	Asn	Val	Thr	Ala	
		515					520					525				
Gly	Asn	Leu	Thr	Ala	Gly	Ser	Thr	Asp	Ala	Val	Asn	Gly	Ser	Gln	Leu	
	530					535					540					
Lys	Thr	Thr	Asn	Asp	Asn	Val	Thr	Thr	Asn	Thr	Thr	Asn	Ile	Ala	Thr	
545					550					555					560	
Asn	Thr	Thr	Asn	Ile	Thr	Asn	Leu	Thr	Asp	Ala	Val	Asn	Gly	Leu	Gly	
				565					570					575		
Asp	Asp	Ser	Leu	Leu	Trp	Asn	Lys	Ala	Ala	Gly	Ala	Phe	Ser	Ala	Ala	
			580					585					590			
His	Gly	Thr	Glu	Ala	Thr	Ser	Lys	Ile	Thr	Asn	Val	Thr	Ala	Gly	Asn	
		595					600					605				

Leu Thr Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr
610 615 620

Thr Asn Asp Asn Val Thr Thr Asn Thr Thr Asn Ile Ala Thr Asn Thr
625 630 635 640

Thr Asn Ile Thr Asn Leu Thr Asp Ala Val Asn Gly Leu Gly Asp Asp
645 650 655

Ser Leu Leu Trp Asn Lys Thr Ala Gly Ala Phe Ser Ala Ala His Gly
660 665 670

Thr Asp Ala Thr Ser Lys Ile Thr Asn Val Thr Ala Gly Asn Leu Thr
675 680 685

Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr Thr Asn
690 695 700

Asp Asn Val Thr Thr Asn Thr Thr Asn Ile Ala Thr Asn Thr Thr Asn
705 710 715 720

Ile Thr Asn Leu Thr Asp Ala Val Asn Gly Leu Gly Asp Asp Ser Leu
725 730 735

Leu Trp Asn Lys Thr Ala Gly Ala Phe Ser Ala Ala His Gly Thr Asp
740 745 750

Ala Thr Ser Lys Ile Thr Asn Val Lys Ala Gly Asp Leu Thr Ala Gly
755 760 765

Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr Thr Asn Asp Asn
770 775 780

Val Ser Thr Asn Thr Thr Asn Ile Thr Asn Leu Thr Asp Ala Val Asn
785 790 795 800

Gly Leu Gly Asp Asp Ser Leu Leu Trp Asn Lys Thr Ala Gly Ala Phe
805 810 815

Ser Ala Ala His Gly Thr Asp Ala Thr Ser Lys Ile Thr Asn Val Lys
820 825 830

Ala Gly Asp Leu Thr Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln
835 840 845

Leu Lys Thr Thr Asn Asp Asn Val Ser Thr Asn Thr Thr Asn Ile Thr
850 855 860

Asn Leu Thr Asp Ser Val Gly Asp Leu Lys Asp Asp Ser Leu Leu Trp
865 870 875 880

Asn Lys Ala Ala Gly Ala Phe Ser Ala Ala His Gly Thr Glu Ala Thr
885 890 895

Ser Lys Ile Thr Asn Leu Leu Ala Gly Lys Ile Ser Ser Asn Ser Thr
900 905 910

Asp Ala Ile Asn Gly Ser Gln Leu Tyr Gly Val Ala Asp Ser Phe Thr
915 920 925

Ser Tyr Leu Gly Gly Gly Ala Asp Ile Ser Asp Thr Gly Val Leu Ser
930 935 940

Gly Pro Thr Tyr Thr Ile Gly Gly Thr Asp Tyr Thr Asn Val Gly Asp
945 950 955 960

Ala Leu Ala Ala Ile Asn Thr Ser Phe Ser Thr Ser Leu Gly Asp Ala
965 970 975

Leu Leu Trp Asp Ala Thr Ala Gly Lys Phe Ser Ala Lys His Gly Ile
980 985 990

Asn Asn Ala Pro Ser Val Ile Thr Asp Val Ala Asn Gly Ala Val Ser
995 1000 1005

Ser Thr Ser Ser Asp Ala Ile Asn Gly Ser Gln Leu Tyr Gly Val
1010 1015 1020

Ser Asp Tyr Ile Ala Asp Ala Leu Gly Gly Asn Ala Val Val Asn
1025 1030 1035

Thr Asp Gly Ser Ile Thr Thr Pro Thr Tyr Ala Ile Ala Gly Gly
1040 1045 1050

Ser	Tyr	Asn	Asn	Val	Gly	Asp	Ala	Leu	Glu	Ala	Ile	Asp	Thr	Thr
1055						1060					1065			
Leu	Asp	Asp	Ala	Leu	Leu	Trp	Asp	Thr	Thr	Ala	Asn	Gly	Gly	Asn
1070						1075					1080			
Gly	Ala	Phe	Ser	Ala	Ala	His	Gly	Lys	Asp	Lys	Thr	Ala	Ser	Val
1085						1090					1095			
Ile	Thr	Asn	Val	Ala	Asn	Gly	Ala	Val	Ser	Ala	Thr	Ser	Asn	Asp
1100						1105					1110			
Ala	Ile	Asn	Gly	Ser	Gln	Leu	Tyr	Ser	Thr	Asn	Lys	Tyr	Ile	Ala
1115						1120					1125			
Asp	Ala	Leu	Gly	Gly	Asp	Ala	Glu	Val	Asn	Ala	Asp	Gly	Thr	Ile
1130						1135					1140			
Thr	Ala	Pro	Thr	Tyr	Thr	Ile	Ala	Asn	Thr	Asp	Tyr	Asn	Asn	Val
1145						1150					1155			
Gly	Glu	Ala	Leu	Asp	Ala	Leu	Asp	Asn	Asn	Ala	Leu	Leu	Trp	Asp
1160						1165					1170			
Glu	Asp	Ala	Gly	Ala	Tyr	Asn	Ala	Ser	His	Asp	Gly	Asn	Ala	Ser
1175						1180					1185			
Lys	Ile	Thr	Asn	Val	Ala	Ala	Gly	Asp	Leu	Ser	Thr	Thr	Ser	Thr
1190						1195					1200			
Asp	Ala	Val	Asn	Gly	Ser	Gln	Leu	Asn	Ala	Thr	Asn	Ile	Leu	Val
1205						1210					1215			
Thr	Gln	Asn	Ser	Gln	Met	Ile	Asn	Gln	Leu	Ala	Gly	Asn	Thr	Ser
1220						1225					1230			
Glu	Thr	Tyr	Ile	Glu	Glu	Asn	Gly	Ala	Gly	Ile	Asn	Tyr	Val	Arg
1235						1240					1245			
Thr	Asn	Asp	Ser	Gly	Leu	Ala	Phe	Asn	Asp	Ala	Ser	Ala	Ser	Gly
1250						1255					1260			
Ile	Gly	Ala	Thr	Ala	Val	Gly	Tyr	Asn	Ala	Val	Ala	Ser	His	Ala

1265							1270							1275
Ser	Ser	Val	Ala	Ile	Gly	Gln	Asp	Ser	Ile	Ser	Glu	Val	Asp	Thr
1280						1285					1290			
Gly	Ile	Ala	Leu	Gly	Ser	Ser	Ser	Val	Ser	Ser	Arg	Val	Ile	Val
1295						1300					1305			
Lys	Gly	Thr	Arg	Asn	Thr	Ser	Val	Ser	Glu	Glu	Gly	Val	Val	Ile
1310						1315					1320			
Gly	Tyr	Asp	Thr	Thr	Asp	Gly	Glu	Leu	Leu	Gly	Ala	Leu	Ser	Ile
1325						1330					1335			
Gly	Asp	Asp	Gly	Lys	Tyr	Arg	Gln	Ile	Ile	Asn	Val	Ala	Asp	Gly
1340						1345					1350			
Ser	Glu	Ala	His	Asp	Ala	Val	Thr	Val	Arg	Gln	Leu	Gln	Asn	Ala
1355						1360					1365			
Ile	Gly	Ala	Val	Ala	Thr	Thr	Pro	Thr	Lys	Tyr	Tyr	His	Ala	Asn
1370						1375					1380			
Ser	Thr	Ala	Glu	Asp	Ser	Leu	Ala	Val	Gly	Glu	Asp	Ser	Leu	Ala
1385						1390					1395			
Met	Gly	Ala	Lys	Thr	Ile	Val	Asn	Gly	Asn	Ala	Gly	Ile	Gly	Ile
1400						1405					1410			
Gly	Leu	Asn	Thr	Leu	Val	Leu	Ala	Asp	Ala	Ile	Asn	Gly	Ile	Ala
1415						1420					1425			
Ile	Gly	Ser	Asn	Ala	Arg	Ala	Asn	His	Ala	Asp	Ser	Ile	Ala	Met
1430						1435					1440			
Gly	Asn	Gly	Ser	Gln	Thr	Thr	Arg	Gly	Ala	Gln	Thr	Asn	Tyr	Thr
1445						1450					1455			
Ala	Tyr	Asn	Met	Asp	Ala	Pro	Gln	Asn	Ser	Val	Gly	Glu	Phe	Ser
1460						1465					1470			
Val	Gly	Ser	Glu	Asp	Gly	Gln	Arg	Gln	Ile	Thr	Asn	Val	Ala	Ala
1475						1480					1485			

Gly Ser Ala Asp Thr Asp Ala Val Asn Val Gly Gln Leu Lys Val
1490 1495 1500

Thr Asp Ala Gln Val Ser Gln Asn Thr Gln Ser Ile Thr Asn Leu
1505 1510 1515

Asn Thr Gln Val Thr Asn Leu Asp Thr Arg Val Thr Asn Ile Glu
1520 1525 1530

Asn Gly Ile Gly Asp Ile Val Thr Thr Gly Ser Thr Lys Tyr Phe
1535 1540 1545

Lys Thr Asn Thr Asp Gly Ala Asp Ala Asn Ala Gln Gly Lys Asp
1550 1555 1560

Ser Val Ala Ile Gly Ser Gly Ser Ile Ala Ala Ala Asp Asn Ser
1565 1570 1575

Val Ala Leu Gly Thr Gly Ser Val Ala Asp Glu Glu Asn Thr Ile
1580 1585 1590

Ser Val Gly Ser Ser Thr Asn Gln Arg Arg Ile Thr Asn Val Ala
1595 1600 1605

Ala Gly Val Asn Ala Thr Asp Ala Val Asn Val Ser Gln Leu Lys
1610 1615 1620

Ser Ser Glu Ala Gly Gly Val Arg Tyr Asp Thr Lys Ala Asp Gly
1625 1630 1635

Ser Ile Asp Tyr Ser Asn Ile Thr Leu Gly Gly Gly Asn Ser Gly
1640 1645 1650

Thr Thr Arg Ile Ser Asn Val Ser Ala Gly Val Asn Asn Asn Asp
1655 1660 1665

Ala Val Asn Tyr Ala Gln Leu Lys Gln Ser Val Gln Glu Thr Lys
1670 1675 1680

Gln Tyr Thr Asp Gln Arg Met Val Glu Met Asp Asn Lys Leu Ser
1685 1690 1695

Lys Thr Glu Ser Lys Leu Ser Gly Gly Ile Ala Ser Ala Met Ala
1700 1705 1710

Met Thr Gly Leu Pro Gln Ala Tyr Thr Pro Gly Ala Ser Met Ala
1715 1720 1725

Ser Ile Gly Gly Gly Thr Tyr Asn Gly Glu Ser Ala Val Ala Leu
1730 1735 1740

Gly Val Ser Met Val Ser Ala Asn Gly Arg Trp Val Tyr Lys Leu
1745 1750 1755

Gln Gly Ser Thr Asn Ser Gln Gly Glu Tyr Ser Ala Ala Leu Gly
1760 1765 1770

Ala Gly Ile Gln Trp
1775

<210> 35

<211> 227

<212> PRT

<213> Escherichia coli

<400> 35

Met Asn Leu Lys Lys Thr Leu Leu Ser Val Leu Met Ile Leu Gln Leu
1 5 10 15

Cys Leu Leu Val Gly Cys Asp Tyr Ile Glu Lys Ala Ser Lys Val Asp
20 25 30

Asp Leu Val Thr Gln Gln Glu Leu Gln Lys Ser Lys Ile Glu Ala Leu
35 40 45

Glu Lys Gln Gln Glu Leu Asp Lys Arg Lys Ile Glu His Phe Glu Lys
50 55 60

Gln Gln Thr Thr Ile Ile Asn Ser Thr Lys Thr Leu Ala Gly Val Val
65 70 75 80

Lys Ala Val Lys Asn Lys Gln Asp Glu Phe Val Phe Thr Glu Phe Asn
85 90 95

Pro Ala Gln Thr Gln Tyr Phe Ile Leu Asn Asn Gly Ser Val Gly Leu
100 105 110

Ala Gly Lys Ile Leu Ser Ile Asp Ala Val Glu Asn Gly Ser Val Ile
115 120 125

Arg Ile Ser Leu Val Asn Leu Leu Ser Val Pro Val Ser Asn Met Gly
130 135 140

Phe Tyr Ala Thr Trp Gly Gly Glu Lys Pro Thr Asp Ile Asn Ala Leu
145 150 155 160

Ala Lys Trp Gln Gln Leu Leu Phe Ser Thr Ala Met Asn Ser Ser Leu
165 170 175

Lys Leu Leu Pro Gly Gln Trp Gln Asp Ile Asn Leu Thr Leu Lys Gly
180 185 190

Val Ser Pro Asn Asn Leu Lys Tyr Leu Lys Leu Ala Ile Asn Met Ala
195 200 205

Asn Ile Gln Phe Asp Arg Leu Gln Pro Ala Glu Ser Pro Gln Arg Lys
210 215 220

Asn Lys Lys
225

<210> 36
<211> 1109
<212> PRT
<213> Escherichia coli

<400> 36
Met Lys Arg Val Val Arg Leu Leu Gly Val Gly Leu Leu Leu Leu Val
1 5 10 15

Val Leu Leu Leu Ile Leu Phe Val Leu Ala Gln Thr Thr Pro Leu Ile
20 25 30

Ser Ala Gln Asp Glu His Ala Val Trp Leu Arg Leu Leu Ile Thr Ala
35 40 45

Ile Val Ile Cys Leu Leu Ser Met Cys Ile Phe Phe Leu Phe Ser Phe
50 55 60

Arg Gln Asn Glu Ala Ser Thr Ile Ser Leu Tyr Ala Gln Pro Thr Asp

65					70						75				80
Ile	Lys	Glu	Ile	Asn	Thr	Glu	Gln	Pro	Asn	Tyr	Ala	Ser	Leu	Leu	Thr
				85					90					95	
Ile	Tyr	Leu	Arg	Asp	Arg	Tyr	Gly	Pro	Phe	Trp	Arg	Arg	Lys	Val	Arg
			100					105					110		
Leu	Leu	Leu	Val	Thr	Gly	Glu	Pro	Glu	Gln	Ala	Glu	Ala	Ile	Ala	Pro
		115					120					125			
Gly	Leu	Thr	Gly	Gln	His	Trp	Leu	Glu	Gly	Asp	His	Thr	Val	Leu	Ile
	130					135					140				
Tyr	Gly	Gly	Arg	Pro	Thr	Ala	Glu	Pro	Asp	Val	Thr	Leu	Leu	Thr	Ala
145					150					155					160
Leu	Lys	Lys	Leu	Arg	Arg	Ser	Arg	Pro	Leu	Asp	Gly	Ile	Ile	Trp	Ala
				165					170					175	
Leu	Thr	Glu	Glu	Gln	Ser	Arg	Gln	Thr	Ala	Gln	Leu	Asp	Lys	Gly	Trp
			180					185					190		
Arg	Gly	Leu	Ile	Asn	Gly	Gly	Lys	Arg	Leu	Gly	Phe	Gln	Ala	Pro	Leu
		195					200					205			
Tyr	Leu	Trp	Gln	Val	Cys	Asp	Asp	Gly	Asp	Tyr	Gln	Thr	Gly	Arg	Pro
	210					215					220				
Leu	Gln	Ser	Val	Gly	Cys	Leu	Leu	Pro	Glu	Arg	Cys	Thr	Pro	Glu	Gln
225					230					235					240
Leu	Ala	Val	Met	Leu	Glu	Ala	Ala	Ala	Asp	Gly	Thr	Gly	His	Val	Ala
				245					250					255	
Ala	Thr	Asp	Arg	Tyr	Arg	Met	Phe	Ser	Ala	Ala	Ser	Gly	Ser	Tyr	Pro
			260					265					270		
Cys	Arg	Ala	Gly	Tyr	Cys	Ser	Leu	Ala	Asp	Arg	Pro	Glu	Thr	Ala	Ala
		275					280					285			
Gly	Arg	Arg	Arg	Ile	Phe	Phe	Pro	Ala	Pro	Ala	Arg	Pro	Asp	Val	Gln
	290					295					300				

Pro Ala Ala Cys Arg Arg Ala Gly Gly Gln His Leu Met Gln Trp Leu
305 310 315 320

Pro Ser Pro Val Trp Ala Gly Val Thr Val Ile Thr Arg Ala Gly Ala
325 330 335

Arg Trp Val Phe Leu Trp Leu Arg Thr Ala Leu Met Ser Ala Val Cys
340 345 350

Val Leu Val Ile Trp Gly Ala Gly Met Thr Thr Ser Phe Phe Ala Asn
355 360 365

Arg Ala Leu Val Gln Glu Thr Gly Ile Gln Thr Ala Arg Ala Leu Asp
370 375 380

Thr Arg Leu Pro Leu Ala Glu Gln Leu Val Ala Leu His Thr Leu Gln
385 390 395 400

Gly Glu Leu Glu Arg Leu Gln Tyr Arg Ile Arg Glu Gly Ala Pro Trp
405 410 415

Tyr Gln Arg Phe Gly Leu Glu Arg Asn Gln Gln Leu Leu Ala Ala Ala
420 425 430

Phe Pro Gly Tyr Ala Gln Ala Ala Asn Arg Leu Val Arg Asp Val Ala
435 440 445

Val Asp His Leu Gln Gln Gln Leu Asn Ala Phe Val Ala Leu Pro Pro
450 455 460

Asn Ser Pro Gln Arg Thr Ala Thr Gly Glu Gln Arg Tyr Lys Gln Leu
465 470 475 480

Lys Ala Leu Leu Met Thr Ser Arg Pro Glu Lys Ala Asp Ala Ala Phe
485 490 495

Phe Ser Thr Thr Leu Met Ala Asp Gly Leu Arg Tyr Glu Asn Ile Pro
500 505 510

Glu Gly Val Arg Gln Ser Val Leu Pro Ser Leu Leu Thr Phe Trp Thr
515 520 525

Ala Asn Leu Pro Glu His Pro Gln Trp Lys Thr Ser Pro Pro Pro Glu
530 535 540

Leu Thr Gly Ala Val Arg Lys Ile Leu Leu Arg Gln Ile Gly Val Arg
545 550 555 560

Asn Ala Glu Asn Thr Leu Tyr Gln Asn Val Leu Gln Gln Val Ser Arg
565 570 575

Asn Tyr Ala Asp Met Thr Leu Ala Asp Met Thr Gly Asp Thr Leu Thr
580 585 590

Glu Ser Leu Phe Ser Thr Glu Gln Thr Val Pro Gly Met Phe Thr Arg
595 600 605

Gln Ala Trp Glu Gly Gln Val Arg Glu Ala Ile Glu Gln Val Val Thr
610 615 620

Ala Arg Arg Glu Glu Ile Asp Trp Val Leu Ser Asp Arg Gln Gln Asp
625 630 635 640

Thr Ser Ala Asp Ile Ser Pro Asp Thr Leu Arg Asn Arg Leu Thr Ser
645 650 655

Arg Tyr Phe Thr Asp Phe Ala Gly Ser Trp Leu Ala Phe Leu Asn Ser
660 665 670

Ile His Trp Lys Lys Glu Asp Ser Leu Ser Gly Ile Leu Asp Gln Leu
675 680 685

Thr Leu Met Ala Asp Ala Arg Gln Ser Pro Leu Ile Ala Leu Thr Asp
690 695 700

Thr Leu Ala Trp Gln Ala Ala Thr Gly Arg Glu Asn Arg Gly Leu Ser
705 710 715 720

Asp Ser Leu Ala Lys Ser Ala Gln Glu Leu Phe Asn Gly Lys Glu Lys
725 730 735

Thr Pro Gln Gln Ser Arg Glu Gly Asp Asp Val Pro Val Gly Pro Leu
740 745 750

Asp Lys Thr Phe Thr Pro Leu Leu Arg Leu Leu Gly Asp Lys Ala Gly
755 760 765

Gly Gly Asp Ser Gln Leu Ser Leu Gln Thr Tyr Leu Thr Arg Val Thr
770 775 780

Arg Val Arg Leu Lys Leu Gln Gln Val Thr Asn Ala Pro Asp Pro Gln
785 790 795 800

Glu Met Thr Gln Gln Leu Ala Gln Thr Val Leu Gln Gly Lys Thr Val
805 810 815

Asp Leu Thr Asp Thr Arg Asp Tyr Gly Arg Leu Ile Ala Ala Ser Leu
820 825 830

Gly Glu Glu Trp Ser Gly Phe Gly Gln Ala Leu Phe Val Arg Pro Val
835 840 845

Glu Gln Ser Trp Arg Gln Val Leu Thr Pro Ala Ala Asp Ser Leu Asn
850 855 860

Arg Gln Trp Gln Arg Ala Ile Val Ser His Trp Asn Gln Asp Phe Ala
865 870 875 880

Gly Arg Tyr Pro Phe Lys Ala Ser Gln Asn Asp Ala Ser Leu Pro Leu
885 890 895

Leu Ala Gln Tyr Leu Arg Asp Asp Gly Arg Ile Asn Leu Phe Ile Ala
900 905 910

Ala Asn Leu Ser Gly Val Leu Lys Arg Glu Gly Arg Tyr Trp Val Ala
915 920 925

Asp Ala Met Asn Thr Gln Gly Leu Thr Val Asn Pro Asp Phe Ile Arg
930 935 940

Ala Leu Asn Arg Leu Arg Asp Val Ala Asp Thr Ala Phe Ala Ser Gly
945 950 955 960

Asp Ala Gly Ile His Phe Glu Leu Arg Ala Lys Pro Ala Arg Asp Val
965 970 975

Met Lys Thr His Leu Val Ile Asp Gly Gln Glu Leu Glu Tyr Phe Asn
980 985 990

Gln Lys Glu Arg Trp Gln Arg Phe Asn Trp Pro Asp Glu Gln Trp Gln
995 1000 1005

Pro Gly Ala Ser Leu Ser Trp Thr Ser Thr Gln Ala Met Glu Arg
1010 1015 1020

Ile Leu Ala Asp Tyr Arg Gly Ser Trp Ser Leu Ile Arg Leu Leu
1025 1030 1035

Glu Gln Ala Gln Val Thr Pro Val Asp Ser Ser Thr Phe Lys Val
1040 1045 1050

Val Trp Lys Ala Gln Asp Gly Leu Pro Leu Asn Tyr Leu Leu Arg
1055 1060 1065

Val Glu Gln Gly Lys Gly Pro Leu Ala Leu Leu Glu Leu Lys Asn
1070 1075 1080

Phe Arg Leu Pro Gly Gln Val Phe Leu Thr Gly Lys Ser Met Lys
1085 1090 1095

Asp Val Glu Glu Tyr Gly Glu Asp Ala Asp Glu
1100 1105

<210> 37
<211> 178
<212> PRT
<213> Escherichia coli

<400> 37
Met Phe Pro Ile Arg Phe Lys Arg Pro Ala Leu Leu Cys Met Ala Met
1 5 10 15

Leu Thr Val Val Leu Ser Gly Cys Gly Leu Ile Gln Lys Val Val Asp
20 25 30

Glu Ser Lys Ser Val Ala Ser Ala Val Phe Tyr Lys Gln Ile Lys Ile
35 40 45

Leu His Leu Asp Phe Phe Ser Arg Ser Ala Leu Asn Thr Asp Ala Glu
50 55 60

Asp Thr Pro Leu Ser Thr Met Val His Val Trp Gln Leu Lys Thr Arg
65 70 75 80

Glu Asp Phe Asp Lys Ala Asp Tyr Asp Thr Leu Phe Met Gln Glu Glu
85 90 95

Lys Thr Leu Glu Lys Asp Val Leu Ala Lys His Thr Val Trp Val Lys
100 105 110

Pro Glu Gly Thr Ala Ser Leu Asn Val Pro Leu Asp Lys Glu Thr Gln
115 120 125

Phe Val Ala Ile Ile Gly Gln Phe Tyr His Pro Asp Glu Lys Ser Asp
130 135 140

Ser Trp Arg Leu Val Ile Lys Arg Asp Glu Leu Glu Ala Asp Lys Pro
145 150 155 160

Arg Ser Ile Glu Leu Met Arg Ser Asp Leu Arg Leu Leu Pro Leu Lys
165 170 175

Asp Lys

<210> 38
<211> 280
<212> PRT
<213> Escherichia coli

<400> 38
Met Ile Ser Gly Gly Asn Met Leu Lys Glu Trp Met Ile Phe Thr Cys

1 5 10 15

Ser Leu Leu Thr Leu Ala Gly Ala Ser Leu Pro Leu Ser Gly Cys Ile
20 25 30

Ser Arg Gly Gln Glu Ser Ile Ser Glu Gly Ala Ala Phe Gly Ala Gly
35 40 45

Ile Leu Arg Glu Pro Gly Ala Thr Lys Lys Ala Asp Thr Lys Asp Leu
50 55 60

Asn Val Pro Pro Pro Val Tyr Gly Pro Pro Gln Val Ile Phe Arg Ile
65 70 75 80

Asp Asp Asn Arg Tyr Phe Thr Leu Glu Asn Tyr Thr His Cys Glu Asn
85 90 95

Gly Gln Thr Phe Tyr Asn Asn Lys Ala Lys Asn Ile His Val Lys Ile
100 105 110

Leu Asp Ala Ser Gly Tyr Leu Phe Lys Gly Arg Leu Phe Trp Leu Ser
115 120 125

Thr Arg Asp Asp Phe Leu Ala Phe Pro Ala Thr Leu Asn Thr Arg His
130 135 140

Ala Ser Cys Met Gly Ser Asn Lys Gly Cys Met Asn Ala Val Ile Val
145 150 155 160

Thr Thr Asp Gly Gly Lys Arg Arg Ser Gly Val Pro Tyr Gly Ser Tyr
165 170 175

Thr Gln Asn Pro Thr Gly Ala Thr Arg Asp Tyr Asp Met Leu Val Met
180 185 190

Asn Asp Gly Phe Tyr Leu Leu Arg Tyr Arg Gly Gly Gln Gly Arg Phe
195 200 205

Ser Pro Val Ile Leu Arg Trp Ile Leu Ser Thr Glu Asp Ser Ser Gly
210 215 220

Val Val Arg Ser Glu Asp Ala Tyr Glu Leu Phe Arg Pro Gly Glu Glu
225 230 235 240

Val Pro Ser Thr Gly Phe Tyr Lys Ile Asp Leu Ser Arg Phe Tyr Pro
245 250 255

Lys Asn Asn Val Met Glu Met Gln Cys Asp Arg Thr Leu Glu Pro Val
260 265 270

Gln Pro Ser Glu Ser Lys Ile Gln
275 280

<210> 39

<211> 501

<212> PRT

<213> Escherichia coli

<400> 39

Met	Glu	His	Val	Ser	Ile	Lys	Thr	Leu	Tyr	His	Leu	Leu	Cys	Cys	Met
1				5					10					15	

Leu	Leu	Phe	Ile	Ser	Ala	Met	Cys	Ala	Leu	Ala	Gln	Glu	His	Glu	Pro
			20					25					30		

Ile	Gly	Ala	Gln	Asp	Glu	Arg	Leu	Ser	Thr	Leu	Ile	His	Gln	Arg	Met
		35					40					45			

Gln	Glu	Ala	Lys	Val	Pro	Ala	Leu	Ser	Val	Ser	Val	Thr	Ile	Lys	Gly
	50					55					60				

Val	Arg	Gln	Arg	Phe	Val	Tyr	Gly	Val	Ala	Asp	Val	Ala	Ser	Gln	Lys
65					70					75					80

Ala	Asn	Thr	Leu	Asp	Thr	Val	Tyr	Glu	Leu	Gly	Ser	Met	Ser	Lys	Ala
				85					90					95	

Phe	Thr	Gly	Leu	Val	Val	Gln	Ile	Leu	Ile	Gln	Glu	Gly	Arg	Leu	Arg
			100					105					110		

Gln	Gly	Asp	Asp	Ile	Ile	Thr	Tyr	Leu	Pro	Glu	Met	Arg	Leu	Asn	Tyr
		115					120					125			

Gln	Gly	Lys	Pro	Ala	Ser	Leu	Thr	Val	Ala	Asp	Phe	Leu	Tyr	His	Thr
	130						135				140				

Ser	Gly	Leu	Pro	Phe	Ser	Thr	Leu	Ala	Arg	Leu	Glu	Asn	Pro	Met	Pro
145					150					155					160

Gly	Ser	Ala	Val	Ala	Gln	Gln	Leu	Arg	Asn	Glu	Asn	Leu	Leu	Phe	Ala
				165					170					175	

Pro	Gly	Ala	Lys	Phe	Ser	Tyr	Ala	Ser	Ala	Asn	Tyr	Asp	Val	Leu	Gly
			180					185					190		

Ala	Val	Ile	Glu	Asn	Val	Thr	Gly	Lys	Thr	Phe	Thr	Glu	Val	Ile	Ala
		195					200					205			

Glu Arg Leu Thr Gln Pro Leu Gly Met Ser Ala Thr Val Ala Val Lys
210 215 220

Gly Asp Glu Ile Ile Val Asn Lys Ala Ser Gly Tyr Lys Leu Gly Phe
225 230 235 240

Gly Lys Pro Val Leu Phe His Ala Pro Leu Ala Arg Asn His Val Pro
245 250 255

Ala Ala Tyr Ile His Ser Thr Leu Pro Asp Met Glu Ile Trp Ile Asp
260 265 270

Ala Trp Leu His Arg Lys Ala Leu Pro Ala Thr Leu Arg Glu Ala Met
275 280 285

Ser Asn Ser Trp Arg Gly Asn Ser Asp Val Pro Leu Ala Ala Asp Asn
290 295 300

Arg Ile Leu Tyr Ala Ser Gly Trp Phe Ile Asp Gln Asn Gln Gly Pro
305 310 315 320

Tyr Ile Ser His Gly Gly Gln Asn Pro Asn Phe Ser Ser Cys Ile Ala
325 330 335

Leu Arg Pro Asp Gln Gln Ile Gly Ile Val Ala Leu Ala Asn Met Asn
340 345 350

Ser Asn Leu Ile Leu Gln Leu Cys Ala Asp Ile Asp Asn Tyr Leu Arg
355 360 365

Ile Gly Lys Tyr Ala Asp Gly Ala Gly Asp Ala Ile Thr Ala Thr Asp
370 375 380

Thr Leu Phe Val Tyr Leu Thr Leu Leu Leu Cys Phe Trp Gly Ala Val
385 390 395 400

Val Val Val Arg Gly Ala Phe Arg Val Tyr Arg Ala Thr Ala His Gly
405 410 415

Pro Gly Lys Gln Gln Arg Leu Arg Leu Arg Val Arg Asp Tyr Ile Ile
420 425 430

Ala Leu Ala Val Pro Gly Leu Val Ala Ala Met Leu Tyr Val Ala Pro
435 440 445

Gly Ile Leu Ser Pro Gly Leu Asp Trp Arg Phe Ile Leu Val Trp Gly
450 455 460

Pro Ser Ser Val Leu Ala Ile Pro Phe Gly Ile Ile Leu Leu Ala Phe
465 470 475 480

Val Leu Thr Leu Asn His Gln Ile Lys Arg Ile Leu Leu His Asn Lys
485 490 495

Glu Trp Asp Asp Glu
500

<210> 40
<211> 682
<212> PRT
<213> Escherichia coli

<400> 40
Met Lys Asn Lys Tyr Ile Ile Ala Pro Gly Ile Ala Val Met Cys Ser
1 5 10 15

Ala Val Ile Ser Ser Gly Tyr Ala Ser Ser Asp Lys Lys Glu Asp Thr
20 25 30

Leu Val Val Thr Ala Ser Gly Phe Thr Gln Gln Leu Arg Asn Ala Pro
35 40 45

Ala Ser Val Ser Val Ile Thr Ser Glu Gln Leu Gln Lys Lys Pro Val
50 55 60

Ser Asp Leu Val Asp Ala Val Lys Asp Val Glu Gly Ile Ser Ile Thr
65 70 75 80

Gly Gly Asn Glu Lys Pro Asp Ile Ser Ile Arg Gly Leu Ser Gly Asp
85 90 95

Tyr Thr Leu Ile Leu Val Asp Gly Arg Arg Gln Ser Gly Arg Glu Ser
100 105 110

Arg Pro Asn Gly Ser Gly Gly Phe Glu Ala Gly Phe Ile Pro Pro Val
115 120 125

Glu Ala Ile Glu Arg Ile Glu Val Ile Arg Gly Pro Met Ser Ser Leu
130 135 140

Tyr Gly Ser Asp Ala Ile Gly Gly Val Ile Asn Ile Ile Thr Lys Pro
145 150 155 160

Val Asn Asn Gln Thr Trp Asp Gly Val Leu Gly Leu Gly Gly Ile Ile
165 170 175

Gln Glu His Gly Lys Phe Gly Asn Ser Thr Thr Asn Asp Phe Tyr Leu
180 185 190

Ser Gly Pro Leu Ile Lys Asp Lys Leu Gly Leu Gln Leu Tyr Gly Gly
195 200 205

Met Asn Tyr Arg Lys Glu Asp Ser Ile Ser Gln Gly Thr Pro Ala Lys
210 215 220

Asp Asn Lys Asn Ile Thr Ala Thr Leu Gln Phe Thr Pro Thr Glu Ser
225 230 235 240

Gln Lys Phe Val Phe Glu Tyr Gly Lys Asn Asn Gln Val His Thr Leu
245 250 255

Thr Pro Gly Glu Ser Leu Asp Ala Trp Thr Met Arg Gly Asn Leu Lys
260 265 270

Gln Pro Asn Ser Lys Arg Glu Thr His Asn Ser Arg Ser His Trp Val
275 280 285

Ala Ala Trp Asn Ala Gln Gly Glu Ile Leu His Pro Glu Ile Ala Val
290 295 300

Tyr Gln Glu Lys Val Ile Arg Glu Val Lys Ser Gly Lys Lys Asp Lys
305 310 315 320

Tyr Asn His Trp Asp Leu Asn Tyr Glu Ser Arg Lys Pro Glu Ile Thr
325 330 335

Asn Thr Ile Ile Asp Ala Lys Val Thr Ala Phe Leu Pro Glu Asn Val
340 345 350

Leu Thr Ile Gly Gly Gln Phe Gln His Ala Glu Leu Arg Asp Asp Ser
355 360 365

Ala Thr Gly Lys Lys Thr Thr Glu Thr Gln Ser Val Ser Ile Lys Gln
370 375 380

Lys Ala Val Phe Ile Glu Asn Glu Tyr Ala Ala Thr Asp Ser Leu Ala
385 390 395 400

Leu Thr Gly Gly Leu Arg Leu Asp Asn His Glu Ile Tyr Gly Ser Tyr
405 410 415

Trp Asn Pro Arg Leu Tyr Ala Val Tyr Asn Leu Thr Asp Asn Leu Thr
420 425 430

Leu Lys Gly Gly Ile Ala Lys Ala Phe Arg Ala Pro Ser Ile Arg Glu
435 440 445

Val Ser Pro Gly Phe Gly Thr Leu Thr Gln Gly Gly Ala Ser Ile Met
450 455 460

Tyr Gly Asn Arg Asp Leu Lys Pro Glu Thr Ser Val Thr Glu Glu Ile
465 470 475 480

Gly Ile Ile Tyr Ser Asn Asp Ser Gly Phe Ser Ala Ser Ala Thr Leu
485 490 495

Phe Asn Thr Asp Phe Lys Asn Lys Leu Thr Ser Tyr Asp Ile Gly Thr
500 505 510

Lys Asp Pro Val Thr Gly Leu Asn Thr Phe Ile Tyr Asp Asn Val Gly
515 520 525

Glu Ala Asn Ile Arg Gly Val Glu Leu Ala Thr Gln Ile Pro Val Tyr
530 535 540

Asp Lys Trp His Val Ser Ala Asn Tyr Thr Phe Thr Asp Ser Arg Arg
545 550 555 560

Lys Ser Asp Asp Glu Ser Leu Asn Gly Lys Ser Leu Lys Gly Glu Pro
565 570 575

Leu Glu Arg Thr Pro Arg His Ala Ala Asn Ala Lys Leu Glu Trp Asp
580 585 590

Tyr Thr Gln Asp Ile Thr Phe Tyr Ser Ser Leu Asn Tyr Thr Gly Lys
595 600 605

Gln Ile Trp Ala Ala Gln Arg Asn Gly Ala Lys Val Pro Arg Val Arg
610 615 620

Asn Gly Phe Thr Ser Met Asp Ile Gly Leu Asn Tyr Gln Ile Leu Pro
625 630 635 640

Asp Thr Leu Ile Asn Phe Ala Val Leu Asn Val Thr Asp Arg Lys Ser
645 650 655

Glu Asp Ile Asp Thr Ile Asp Gly Asn Trp Gln Val Asp Glu Gly Arg
660 665 670

Arg Tyr Trp Ala Asn Val Arg Val Ser Phe
675 680

<210> 41

<211> 164

<212> PRT

<213> Escherichia coli

<400> 41

Met Gly Phe Arg Lys Thr Ile Ile Thr Ser Val Gly Leu Ile Phe Ile
1 5 10 15

Ser Phe Ser Phe Val Ala Lys Cys Ser Gln Leu Lys Asn Leu Asn Asn
20 25 30

Tyr Ser Val Met Leu Cys Gly Lys Val Ser Asn Asn Ile Leu Asp Asp
35 40 45

Ile Gly Gly Tyr Lys Glu Arg Asn Ile Leu Met Leu Arg Ala Ile Lys
50 55 60

Lys Ile Ile Ile Met Thr Ile Val Asn Ile Ile Phe Phe Tyr Ser Phe
65 70 75 80

Gln Ser Thr Ala Asp Glu Met Val Leu Ile Lys Lys Tyr Gly Phe Gly
85 90 95

Leu Glu Arg Asp Ile Lys Gly Arg Pro Leu Ile Tyr Pro Ile Glu Asn
100 105 110

Tyr Asp Glu Cys Lys Lys Lys Cys Asn His Met Asn Tyr Ile Ala Asp
115 120 125

Val Asn Ala Gln Leu Ala Met Ser Lys Lys Asn Asn Arg Ile Phe Ala
130 135 140

Asn Ile Thr Phe Thr Asn Asn Ser Ser Thr Thr Tyr Phe Phe Leu Asn
145 150 155 160

Ile Ile Tyr Leu

<210> 42

<211> 218

<212> PRT

<213> Escherichia coli

<400> 42

Met Asn Gln Ile Lys Asp Asn Lys Val Ile Met Lys Ile Lys Asn Leu
1 5 10 15

Ile Ser Val Ile Leu Leu Ser Gly Gly Ile Met Gly Thr Gly Leu Tyr
20 25 30

Ser Ser Asp Asn His Gln Lys Ile Arg Ser Arg Phe Asn Ile Gln Glu
35 40 45

Ser Tyr Cys Ala Ile Lys Thr Asn Gly Val Leu Gly Phe Ser Asn Arg
50 55 60

Lys Asp Val Leu Arg Glu Asn Gly Asp Ser Thr Gly Thr Thr Ser Ser
65 70 75 80

Ser Thr Asn Ala Met Met Leu Met Glu Asn Gly Glu Asn Glu Ile Ser
85 90 95

Leu Glu Ile Gly Ala Leu Arg Trp Phe Ser Asp Lys Pro Ala Ser Thr
100 105 110

Glu Glu Arg Gly His Phe Ser Gln Lys Ala Gly Cys Ser Leu Asp Leu
115 120 125

Val Arg Phe Val Lys Gln Glu Glu Thr Ile Leu Ser Ser Ile Lys Val
130 135 140

Thr Ile Asn Gln Gln Gly Ile Pro Glu Ala Gln Pro Asp Ser Met His
145 150 155 160

Pro Val Ile Arg Lys Glu Ile Leu Ala Glu Gln Ala Glu Pro Gly Phe
165 170 175

Ile Asp Pro Asp Tyr Phe Asn Glu Thr Tyr Phe Pro Lys Gly Met Lys
180 185 190

Val Tyr Gln Phe Thr Gln Lys Val Ser Val Ala Gly Leu Pro Asp Gly
195 200 205

Pro Gly Arg Ser Thr Pro Phe Thr Gly Ala
210 215

<210> 43

<211> 2732

<212> PRT

<213> Escherichia coli

<400> 43

Met His Gln Pro Pro Val Arg Phe Thr Tyr Arg Leu Leu Ser Tyr Leu
1 5 10 15

Val Ser Ala Ile Ile Ala Gly Gln Pro Leu Leu Pro Ala Val Gly Ala
20 25 30

Val Ile Thr Pro Gln Asn Gly Ala Gly Met Asp Lys Ala Ala Asn Gly
35 40 45

Val Pro Val Val Asn Ile Ala Thr Pro Asn Gly Ala Gly Ile Ser His
50 55 60

Asn Arg Phe Thr Asp Tyr Asn Val Gly Lys Glu Gly Leu Ile Leu Asn
65 70 75 80

Asn Ala Thr Gly Lys Leu Asn Pro Thr Gln Leu Gly Gly Leu Ile Gln
85 90 95

Asn Asn Pro Asn Leu Lys Ala Gly Gly Glu Ala Lys Gly Ile Ile Asn
100 105 110

Glu Val Thr Gly Gly Lys Arg Ser Leu Leu Gln Gly Tyr Thr Glu Val
115 120 125

Ala Gly Lys Ala Ala Asn Val Met Val Ala Asn Pro Tyr Gly Ile Thr
130 135 140

Cys Asp Gly Cys Gly Phe Ile Asn Thr Pro His Ala Thr Leu Thr Thr
145 150 155 160

Gly Lys Pro Val Met Asn Ala Asp Gly Ser Leu Gln Ala Leu Glu Val
165 170 175

Thr Glu Gly Ser Ile Thr Ile Asn Gly Ala Gly Leu Asp Gly Thr Arg
180 185 190

Ser Asp Ala Val Ser Ile Ile Ala Arg Ala Thr Glu Val Asn Ala Ala
195 200 205

Leu His Ala Lys Asp Leu Thr Val Thr Ala Gly Ala Asn Arg Val Thr
210 215 220

Ala Asp Gly Arg Val Arg Ala Leu Lys Gly Glu Gly Asp Val Pro Lys
225 230 235 240

Val Ala Val Asp Thr Gly Ala Leu Gly Gly Met Tyr Ala Arg Arg Ile
245 250 255

His Leu Thr Ser Thr Glu Ser Gly Val Gly Val Asn Leu Gly Asn Leu
260 265 270

Tyr Ala Arg Asp Gly Asp Ile Thr Leu Asp Ala Ser Gly Arg Leu Thr
275 280 285

Val Asn Asn Ser Leu Ala Thr Gly Ala Val Thr Ala Lys Gly Gln Gly
290 295 300

Val Thr Leu Thr Gly Asp His Lys Ala Gly Gly Asn Leu Ser Val Ser
305 310 315 320

Ser Arg Arg Asp Ile Val Leu Ser Asn Gly Thr Leu Asn Ser Asp Lys

				325						330					335	
Asp	Leu	Ser	Leu	Thr	Ala	Gly	Gly	Arg	Ile	Thr	Gln	Gln	Asn	Glu	Lys	
			340					345					350			
Leu	Thr	Ala	Gly	Arg	Asp	Val	Thr	Leu	Ala	Ala	Lys	Asn	Ile	Thr	Gln	
		355					360					365				
Asp	Thr	Ala	Ser	Gln	Ile	Asn	Ala	Ala	Arg	Asp	Ile	Val	Thr	Val	Ala	
	370					375					380					
Ser	Asp	Thr	Leu	Thr	Thr	Gln	Gly	Gln	Ile	Thr	Ala	Gly	Gln	Asn	Leu	
385					390					395					400	
Thr	Ala	Ser	Ala	Thr	Thr	Leu	Thr	Gln	Asp	Gly	Ile	Leu	Leu	Ala	Lys	
				405					410					415		
Ser	His	Ala	Gly	Leu	Asn	Ala	Gly	Thr	Leu	Asn	Asn	Ser	Gly	Ala	Val	
			420					425					430			
Gln	Gly	Ala	Thr	Leu	Thr	Leu	Gly	Ser	Thr	Thr	Leu	Ser	Asn	Ser	Gly	
		435					440					445				
Ser	Leu	Leu	Ser	Gly	Gly	Pro	Leu	Thr	Met	Asn	Thr	Arg	Asp	Phe	Thr	
	450					455					460					
Gln	Ser	Gly	Arg	Thr	Gly	Ala	Lys	Gly	Lys	Val	Asp	Ile	Met	Ala	Ser	
465					470					475					480	
Gly	Lys	Leu	Thr	Ser	Thr	Gly	Leu	Leu	Val	Thr	Met	His	Leu	Val	Leu	
				485					490					495		
Lys	Ala	Gln	Asp	Val	Thr	Gln	Asn	Gly	Val	Leu	Ser	Gly	Gly	Lys	Gly	
			500					505					510			
Leu	Thr	Val	Ser	Ala	Thr	Ser	Ser	Gly	Lys	Lys	Ser	Val	Thr	His	Ser	
		515					520					525				
Asp	Ala	Ala	Met	Thr	Leu	Asn	Val	Thr	Thr	Val	Ala	Leu	Asp	Gly	Glu	
	530					535					540					
Thr	Ser	Ala	Gly	Asp	Thr	Leu	Arg	Val	Gln	Ala	Asp	Lys	Leu	Ser	Thr	
545					550					555					560	

Ala Ala Gly Ala Gln Leu Gln Ser Gly Lys Asn Leu Ser Ile Asn Ala
565 570 575

Arg Asp Ala Arg Leu Ala Gly Thr Gln Ala Ala Gln Gln Thr Met Val
580 585 590

Val Asn Ala Ser Glu Lys Leu Thr His Ser Gly Lys Ser Ser Ala Pro
595 600 605

Ser Leu Ser Leu Ser Ala Pro Glu Leu Thr Ser Ser Gly Val Leu Val
610 615 620

Gly Ser Ala Leu Asn Thr Gln Ser Gln Thr Leu Thr Asn Ser Gly Leu
625 630 635 640

Leu Gln Gly Glu Ala Ser Leu Thr Val Asn Thr Gln Arg Leu Asp Asn
645 650 655

Gln Gln Asn Gly Thr Leu Tyr Ser Ala Ala Asp Leu Thr Leu Asp Ile
660 665 670

Pro Asp Ile Arg Asn Ser Gly Leu Ile Thr Gly Asp Asn Gly Leu Met
675 680 685

Leu Asn Ala Val Ser Leu Ser Asn Pro Gly Lys Ile Ile Ala Asp Thr
690 695 700

Leu Ser Val Arg Ala Thr Thr Leu Asp Gly Asp Gly Leu Leu Gln Gly
705 710 715 720

Ala Gly Ala Leu Ala Leu Ala Gly Asp Thr Leu Ser Gln Gly Ser His
725 730 735

Gly Arg Trp Leu Thr Ala Asp Asp Leu Ser Leu Arg Gly Lys Thr Leu
740 745 750

Asn Thr Ala Gly Thr Thr Gln Gly Gln Asn Ile Thr Val Gln Ala Asp
755 760 765

Arg Trp Ala Asn Ser Gly Ser Val Leu Ala Thr Gly Asn Leu Thr Ala
770 775 780

Ser Ala Thr Gly Gln Leu Thr Ser Thr Gly Asp Ile Met Ser Gln Gly
785 790 795 800

Asp Thr Thr Leu Lys Ala Ala Thr Thr Asp Asn Arg Gly Ser Leu Leu
805 810 815

Ser Ala Gly Thr Leu Ser Leu Asp Gly Asn Ser Leu Asp Asn Arg Gly
820 825 830

Thr Val Gln Gly Asn His Val Thr Ile Arg Gln Asn Ser Val Thr Asn
835 840 845

Ser Gly Thr Leu Thr Gly Ile Ala Ala Leu Thr Leu Ala Ala Arg Met
850 855 860

Ala Ser Pro Gln Pro Ala Leu Met Asn Asn Gly Gly Ser Leu Leu Thr
865 870 875 880

Ser Gly Asp Leu Thr Ile Thr Ala Gly Ser Ile Thr Ser Ser Gly His
885 890 895

Trp Gln Gly Lys Arg Val Leu Ile Thr Ala Asp Ser Leu Ala Asn Ser
900 905 910

Gly Ala Ile Gln Ala Ala Asp Ser Leu Thr Ala Arg Leu Thr Gly Glu
915 920 925

Leu Val Ser Thr Ala Gly Ser Lys Val Thr Ser Asn Gly Glu Met Ala
930 935 940

Leu Ser Ala Leu Asn Leu Ser Asn Ser Gly Gln Trp Ile Ala Lys Asn
945 950 955 960

Leu Thr Leu Lys Ala Asn Ser Leu Thr Ser Ala Gly Asp Ile Thr Gly
965 970 975

Val Asp Thr Leu Thr Leu Thr Val Asn Gln Thr Leu Asn Asn Gln Ala
980 985 990

Asn Gly Lys Leu Leu Ser Ala Gly Val Leu Thr Leu Lys Ala Asp Ser
995 1000 1005

Val	Thr	Asn	Asp	Gly	Gln	Leu	Gln	Gly	Asn	Val	Thr	Thr	Ile	Thr
1010						1015					1020			
Ala	Gly	Gln	Leu	Thr	Asn	Gly	Gly	His	Leu	Gln	Gly	Glu	Thr	Leu
1025						1030					1035			
Thr	Leu	Thr	Ala	Ser	Gly	Gly	Val	Asn	Asn	Arg	Ser	Gly	Gly	Val
1040						1045					1050			
Leu	Met	Ser	Arg	Asn	Ala	Leu	Asn	Val	Ser	Thr	Ala	Thr	Leu	Ser
1055						1060					1065			
Asn	Gln	Ser	Thr	Ile	Gln	Gly	Gly	Gly	Gly	Val	Ser	Leu	Asn	Ala
1070						1075					1080			
Thr	Asp	Arg	Leu	Gln	Asn	Asp	Gly	Lys	Ile	Leu	Ser	Gly	Ser	Asn
1085						1090					1095			
Leu	Thr	Leu	Thr	Ala	Gln	Val	Leu	Ala	Asn	Thr	Gly	Ser	Gly	Leu
1100						1105					1110			
Val	Gln	Ala	Ala	Thr	Leu	Leu	Leu	Asp	Val	Val	Asn	Thr	Val	Asn
1115						1120					1125			
Gly	Gly	Arg	Val	Leu	Ala	Thr	Gly	Ser	Asp	Val	Lys	Gly	Thr	Thr
1130						1135					1140			
Leu	Asn	Asn	Thr	Gly	Thr	Leu	Gln	Gly	Ala	Thr	Leu	Val	Asn	Tyr
1145						1150					1155			
His	Thr	Phe	Ser	Ser	Gly	Thr	Leu	Leu	Gly	Thr	Ser	Gly	Leu	Gly
1160						1165					1170			
Val	Lys	Gly	Ser	Ser	Leu	Leu	Gln	Asn	Gly	Thr	Gly	Arg	Leu	Tyr
1175						1180					1185			
Ser	Ala	Gly	Asn	Leu	Leu	Leu	Asp	Ala	Gln	Asp	Phe	Ser	Gly	Gln
1190						1195					1200			
Gly	Gln	Val	Val	Ala	Thr	Gly	Asp	Val	Thr	Leu	Lys	Leu	Ile	Ala
1205						1210					1215			
Ala	Leu	Thr	Asn	His	Gly	Thr	Leu	Ala	Ala	Gly	Lys	Thr	Leu	Ser

1220		1225		1230
Val Thr Ser Gln Asn Ala Ile Thr Asn Gly Gly Val Met Gln Gly				
1235		1240		1245
Asp Ala Met Val Leu Gly Ala Gly Glu Ala Phe Thr Asn Asn Gly				
1250		1255		1260
Leu Thr Ala Gly Lys Gly Asn Ser Val Phe Ser Ala Gln Arg Leu				
1265		1270		1275
Phe Leu Asn Ala Pro Gly Ser Leu Gln Gly Gly Gly Asp Val Ser				
1280		1285		1290
Leu Asn Ser Arg Ser Asp Ile Thr Ile Ser Gly Phe Thr Gly Thr				
1295		1300		1305
Ala Gly Ser Leu Thr Met Asn Val Ala Gly Thr Leu Leu Asn Ser				
1310		1315		1320
Ala Leu Ile Tyr Ala Gly Asn Asn Leu Lys Leu Phe Thr Asp Arg				
1325		1330		1335
Leu His Asn Gln His Gly Asp Ile Leu Ala Gly Asn Ser Leu Trp				
1340		1345		1350
Val Gln Lys Asp Ala Ser Gly Gly Ala Asn Thr Glu Ile Ile Asn				
1355		1360		1365
Asn Ser Gly Asn Ile Glu Thr His Gln Gly Asp Ile Val Val Arg				
1370		1375		1380
Thr Gly His Leu Leu Asn Gln Arg Glu Gly Phe Ser Ala Thr Thr				
1385		1390		1395
Thr Thr Arg Thr Asn Pro Ser Ser Ile Gln Gly Met Gly Asn Ala				
1400		1405		1410
Leu Val Asp Ile Pro Leu Ser Leu Leu Pro Asp Gly Ser Tyr Gly				
1415		1420		1425
Tyr Phe Thr Arg Glu Val Glu Asn Gln His Gly Thr Pro Cys Asn				
1430		1435		1440

Gly	His	Gly	Ala	Cys	Asn	Ile	Thr	Met	Asp	Thr	Leu	Tyr	Tyr	Tyr
1445						1450					1455			
Ala	Pro	Phe	Ala	Asp	Ser	Ala	Thr	Gln	Arg	Phe	Leu	Ser	Ser	Gln
1460						1465					1470			
Asn	Ile	Thr	Thr	Val	Thr	Gly	Ala	Asp	Asn	Pro	Ala	Gly	Arg	Ile
1475						1480					1485			
Ala	Ser	Gly	Arg	Asn	Leu	Ser	Ala	Glu	Ala	Glu	Arg	Leu	Glu	Asn
1490						1495					1500			
Arg	Ala	Ser	Phe	Ile	Leu	Ala	Asn	Gly	Asp	Ile	Ala	Leu	Ser	Gly
1505						1510					1515			
Arg	Glu	Leu	Ser	Asn	Gln	Ser	Trp	Gln	Thr	Gly	Thr	Glu	Asn	Glu
1520						1525					1530			
Tyr	Leu	Val	Tyr	Arg	Tyr	Asp	Pro	Lys	Thr	Phe	Tyr	Gly	Ser	Tyr
1535						1540					1545			
Ala	Thr	Gly	Ser	Leu	Asp	Lys	Leu	Pro	Leu	Leu	Ser	Pro	Glu	Phe
1550						1555					1560			
Glu	Asn	Asn	Thr	Ile	Arg	Phe	Ser	Leu	Asp	Gly	Arg	Glu	Lys	Asp
1565						1570					1575			
Tyr	Thr	Pro	Gly	Lys	Thr	Tyr	Tyr	Ser	Val	Ile	Gln	Ala	Gly	Gly
1580						1585					1590			
Asp	Val	Lys	Thr	Arg	Phe	Thr	Ser	Ser	Ile	Asn	Asn	Gly	Thr	Thr
1595						1600					1605			
Thr	Ala	His	Ala	Gly	Ser	Val	Ser	Pro	Val	Val	Ser	Ala	Pro	Val
1610						1615					1620			
Leu	Asn	Thr	Leu	Ser	Gln	Gln	Thr	Gly	Gly	Asp	Ser	Leu	Thr	Gln
1625						1630					1635			
Thr	Ala	Leu	Gln	Gln	Tyr	Glu	Pro	Val	Val	Val	Gly	Ser	Pro	Gln
1640						1645					1650			

Trp His Asp Glu Leu Ala Gly Ala Leu Lys Asn Ile Ala Gly Gly
1655 1660 1665

Ser Pro Leu Thr Gly Gln Thr Gly Ile Ser Asp Asp Trp Pro Leu
1670 1675 1680

Pro Ser Gly Asn Asn Gly Tyr Leu Val Pro Ser Thr Asp Pro Asp
1685 1690 1695

Ser Pro Tyr Leu Ile Thr Val Asn Pro Lys Leu Asp Gly Leu Gly
1700 1705 1710

Gln Val Asp Ser His Leu Phe Ala Gly Leu Tyr Glu Leu Leu Gly
1715 1720 1725

Ala Lys Pro Gly Gln Ala Pro Arg Glu Thr Ala Pro Ser Tyr Thr
1730 1735 1740

Asp Glu Lys Gln Phe Leu Gly Ser Ser Tyr Phe Leu Asp Arg Leu
1745 1750 1755

Gly Leu Lys Pro Glu Lys Asp Tyr Arg Phe Leu Gly Asp Ala Val
1760 1765 1770

Phe Asp Thr Arg Tyr Val Ser Asn Ala Val Leu Ser Arg Thr Gly
1775 1780 1785

Ser Arg Tyr Leu Asn Gly Leu Gly Ser Asp Thr Glu Gln Met Arg
1790 1795 1800

Tyr Leu Met Asp Asn Ala Ala Arg Gln Gln Lys Gly Leu Gly Leu
1805 1810 1815

Glu Phe Gly Val Ala Leu Thr Ala Glu Gln Ile Ala Gln Leu Asp
1820 1825 1830

Gly Ser Ile Leu Trp Trp Glu Ser Val Thr Ile Asn Gly Gln Thr
1835 1840 1845

Val Met Val Pro Lys Leu Tyr Leu Ser Pro Glu Asp Ile Thr Leu
1850 1855 1860

His Asn Gly Ser Val Ile Ser Gly Asn Asn Val Gln Leu Ala Gly
1865 1870 1875

Gly Asn Ile Thr Asn Ser Gly Gly Ser Ile Asn Ala Gln Asn Asp
1880 1885 1890

Leu Ser Leu Asp Ser Ser Gly Tyr Ile Asp Asn Leu Asn Ala Gly
1895 1900 1905

Leu Ile Ser Ala Gly Gly Ser Leu Asp Leu Ser Ala Ile Gly Asp
1910 1915 1920

Ile Ser Asn Ile Ser Ser Val Ile Ser Gly Lys Thr Val Gln Leu
1925 1930 1935

Glu Ser Val Ser Gly Asn Ile Ser Asn Ile Thr Arg Arg Gln Gln
1940 1945 1950

Trp Asn Ala Gly Ser Asp Ser Gln Tyr Gly Gly Val His Leu Ser
1955 1960 1965

Gly Thr Asp Thr Gly Pro Val Ala Thr Ile Lys Gly Thr Asp Ser
1970 1975 1980

Leu Ser Leu Asp Ala Gly Lys Asn Ile Asp Ile Thr Gly Ala Thr
1985 1990 1995

Val Ser Ser Gly Gly Asp Leu Gly Met Ser Ala Gly Asn Asp Ile
2000 2005 2010

Asn Ile Ala Ala Asn Leu Ile Ser Gly Ser Lys Ser Gln Ser Gly
2015 2020 2025

Phe Trp His Thr Asp Asp Asn Ser Ser Ser Ser Thr Thr Ser Gln
2030 2035 2040

Gly Ser Ser Ile Ser Ala Gly Gly Asn Leu Ala Met Ala Ala Gly
2045 2050 2055

His Asn Leu Asp Val Thr Ala Ser Ser Val Ser Ala Gly His Ser
2060 2065 2070

Ala	Leu	Leu	Ser	Cys	Arg	Ser	Arg	Pro	Ser	Leu	Glu	Cys	Ser	Gln
2075						2080					2085			
Gly	Lys	Ala	Lys	Thr	Ser	Arg	Asn	Gly	Arg	Ser	Glu	Ser	His	Glu
2090						2095					2100			
Ser	His	Ala	Ala	Val	Ser	Thr	Val	Thr	Ala	Gly	Asp	Asn	Phe	Leu
2105						2110					2115			
Leu	Val	Ala	Gly	Arg	Asp	Ile	Ala	Ser	Gln	Ala	Ala	Gly	Met	Ala
2120						2125					2130			
Ala	Glu	Asn	Asn	Val	Val	Ile	Arg	Gly	Gly	Arg	Asp	Val	Asn	Leu
2135						2140					2145			
Val	Ala	Glu	Ser	Ala	Gly	Ala	Gly	Asp	Ser	Tyr	Thr	Ser	Lys	Lys
2150						2155					2160			
Lys	Lys	Glu	Ile	Asn	Glu	Thr	Val	Arg	Gln	Gln	Gly	Thr	Glu	Ile
2165						2170					2175			
Ala	Ser	Gly	Gly	Asp	Thr	Thr	Val	Asn	Ala	Gly	Arg	Asp	Ile	Thr
2180						2185					2190			
Ala	Val	Ala	Ser	Ser	Val	Thr	Ala	Thr	Gly	Asn	Ile	Ser	Val	Asn
2195						2200					2205			
Ala	Gly	Arg	Asp	Val	Ala	Leu	Thr	Thr	Ala	Thr	Glu	Ser	Asp	Tyr
2210						2215					2220			
His	Tyr	Leu	Glu	Thr	Lys	Lys	Lys	Ser	Gly	Gly	Phe	Leu	Ser	Lys
2225						2230					2235			
Lys	Thr	Thr	Arg	Thr	Ile	Ser	Glu	Asp	Ser	Ala	Thr	Arg	Glu	Ala
2240						2245					2250			
Gly	Ser	Leu	Leu	Ser	Gly	Asn	Arg	Val	Thr	Val	Asn	Ala	Gly	Asp
2255						2260					2265			
Asn	Leu	Thr	Val	Glu	Gly	Ser	Asp	Val	Val	Ala	Asp	Arg	Asp	Val
2270						2275					2280			
Ser	Leu	Ala	Ala	Gly	Asn	His	Val	Asp	Val	Leu	Ala	Ala	Thr	Ser

2285						2290						2295			
Thr	Asp	Thr	Ser	Trp	Arg	Phe	Lys	Glu	Thr	Lys	Lys	Ser	Gly	Leu	
2300						2305					2310				
Met	Gly	Thr	Gly	Gly	Ile	Gly	Phe	Thr	Ile	Gly	Ser	Ser	Lys	Thr	
2315						2320					2325				
Thr	His	Asp	Arg	Arg	Glu	Ala	Gly	Thr	Thr	Gln	Ser	Gln	Ser	Ala	
2330						2335					2340				
Ser	Thr	Ile	Gly	Ser	Thr	Ala	Gly	Asn	Val	Ser	Ile	Thr	Ala	Gly	
2345						2350					2355				
Lys	Gln	Ala	His	Ile	Ser	Gly	Ser	Asp	Val	Ile	Ala	Asn	Arg	Asp	
2360						2365					2370				
Ile	Ser	Ile	Thr	Gly	Asp	Ser	Val	Val	Val	Asp	Pro	Gly	His	Asp	
2375						2380					2385				
Arg	Arg	Thr	Val	Asp	Glu	Lys	Phe	Glu	Gln	Lys	Lys	Ser	Gly	Leu	
2390						2395					2400				
Thr	Val	Ala	Leu	Ser	Gly	Thr	Val	Gly	Ser	Ala	Ile	Asn	Asn	Ala	
2405						2410					2415				
Val	Thr	Ser	Ala	Gln	Glu	Thr	Lys	Glu	Ser	Ser	Asp	Ser	Arg	Leu	
2420						2425					2430				
Lys	Ala	Leu	Gln	Ala	Thr	Lys	Thr	Ala	Leu	Ser	Gly	Val	Gln	Ala	
2435						2440					2445				
Gly	Gln	Ala	Ala	Thr	Met	Ala	Ser	Ala	Thr	Gly	Asp	Pro	Asn	Ala	
2450						2455					2460				
Gly	Val	Ser	Leu	Ser	Leu	Thr	Thr	Gln	Lys	Ser	Lys	Ser	Gln	Gln	
2465						2470					2475				
His	Ser	Glu	Ser	Asp	Thr	Val	Ser	Gly	Ser	Thr	Leu	Asn	Ala	Gly	
2480						2485					2490				
Asn	Asn	Leu	Ser	Val	Val	Ala	Thr	Gly	Lys	Asn	Arg	Gly	Asp	Asn	
2495						2500					2505				

Arg Gly Asp Ile Val Ile Ala Gly Ser Gln Leu Lys Ala Gly Gly
2510 2515 2520

Asn Thr Ser Leu Asp Ala Ala Asn Asp Ile Leu Leu Ser Gly Ala
2525 2530 2535

Ala Asn Thr Gln Lys Thr Thr Gly Arg Asn Ser Ser Ser Gly Gly
2540 2545 2550

Gly Val Gly Val Ser Ile Gly Ala Gly Lys Gly Ala Gly Ile Ser
2555 2560 2565

Ala Phe Ala Ser Val Asn Ala Ala Lys Gly Arg Glu Lys Gly Asn
2570 2575 2580

Gly Thr Thr Thr Asp Lys Thr Val Thr Ile Asn Ser Gly Arg Asp
2585 2590 2595

Thr Val Leu Asn Gly Ala Gln Val Asn Gly Asn Arg Ile Ile Ala
2600 2605 2610

Asp Val Gly His Asp Leu Leu Ile Ser Ser Gln Gln Asp Thr Ser
2615 2620 2625

Lys Tyr Asp Ser Lys Gln Thr Ser Val Ala Ala Gly Gly Ser Phe
2630 2635 2640

Thr Phe Gly Ser Met Thr Gly Ser Gly Tyr Ile Ala Ala Ser Arg
2645 2650 2655

Asp Lys Met Lys Ser Arg Phe Asp Ser Val Ala Glu Gln Thr Gly
2660 2665 2670

Met Phe Ala Arg Val Met Val Ala Ser Thr Ser Gln Trp Val Asn
2675 2680 2685

Ile Pro Asn Trp Met Val Arg Ser Leu Pro His Cys His Thr Gly
2690 2695 2700

Glu Lys Pro Pro Gly Tyr Arg Thr Leu Gly Leu Val Thr Leu Gln
2705 2710 2715

Arg Ser Gly Ile Ile Lys Ser Ser His Arg Trp Asn Gln Ser
2720 2725 2730

<210> 44
<211> 321
<212> PRT
<213> Escherichia coli

<400> 44
Met Met Leu Lys Lys Thr Ile Phe Ile Leu Thr Leu Phe Ser Gly Asn
1 5 10 15

Val Ile Ala Ala Thr Val Glu Leu Gly Phe Glu Asn Glu Gln Tyr Asn
20 25 30

Tyr Ala Tyr Arg Ser Ala Asp Val Phe Met Pro Tyr Ile Lys Ser Asn
35 40 45

Phe Asn Pro Val Thr Asp Ser Ala Leu Asn Val Ser Leu Thr Tyr Met
50 55 60

Tyr Gln Asp Gln Tyr Gly Lys Lys His Lys Lys Thr Ser Glu Asp Arg
65 70 75 80

Phe Lys Thr Asn Arg Asp Arg Ile Glu Leu Tyr Leu Lys Gly Tyr Thr
85 90 95

Leu Asn Arg Gly Ala Tyr Ser Phe Ser Pro Ser Ala Gly Phe Arg Tyr
100 105 110

Glu Ser Trp Asp Val Asn Tyr Asp Asn Pro Lys Lys Gln Asp Lys Trp
115 120 125

Lys Leu Glu Leu Arg Phe Tyr Pro Asn Met Thr Tyr Lys Leu Asn Asp
130 135 140

Gln Leu Ser Leu Tyr Met Asn Gly Phe Val Ala Pro Val Phe Phe Lys
145 150 155 160

Thr Gln Gln Glu Ser Arg Lys Asp Asn Asn Tyr Val Lys Gly Lys Leu
165 170 175

Gly Ala Lys Arg Tyr Asn Asn Asp Tyr Tyr Gln Glu Leu Gln Ile Leu
180 185 190

Gly Val Arg Tyr Lys Phe Asn Asn Asp Asn Thr Leu Trp Ala Ser Val
195 200 205

Tyr Asn Glu Arg Lys Tyr Asn Gln His Ser Ser Lys Tyr Asp Arg Trp
210 215 220

Gln Leu Arg Gly Gly Tyr Asp Phe Lys Val Thr Glu Glu Phe Val Leu
225 230 235 240

Ser Pro Phe Ile Arg Tyr Asp Leu Ser Tyr Arg Glu Lys Asn Leu Glu
245 250 255

Ser Thr Ser Asn Asn Gly Leu Ser Lys Asn Asn Lys Glu Ile Arg Thr
260 265 270

Gly Ala Ser Phe Ser Tyr Lys Ile Ile Pro Ser Val Lys Leu Val Gly
275 280 285

Glu Ile Tyr Arg Gln Thr Thr Asn Ile Glu Asn Tyr Tyr Gly Glu His
290 295 300

Ser Glu Asp Lys Asn Arg Met Phe Tyr Lys Leu Gly Ile Asn Lys Thr
305 310 315 320

Phe

<210> 45

<211> 587

<212> PRT

<213> Escherichia coli

<400> 45

Met Gln His Arg Gln Lys Asn Ile Leu Thr Lys Thr Ser Leu Leu Ser
1 5 10 15

Arg Ala Leu Ser Val Pro Cys Cys Asp Met Phe Arg Arg Gly Ser Pro
20 25 30

Trp Ile Cys Tyr Leu Ser Leu Ser Val Phe Ser Gly Cys Phe Ile Pro
35 40 45

Ala Phe Ser Ser Pro Ala Ala Met Leu Ser Pro Gly Asp Arg Ser Ala

50	55	60
Ile Gln Gln Gln Gln Gln Gln Leu Leu Asp Glu Asn Gln Arg Gln Arg 65 70 75 80		
Asp Ala Leu Glu Arg Pro Leu Thr Ile Thr Pro Ser Pro Glu Thr Ser 85 90 95		
Ala Gly Thr Glu Gly Pro Cys Phe Thr Val Ser Ser Ile Val Val Ser 100 105 110		
Gly Ala Thr Arg Leu Thr Ser Ala Glu Thr Asp Arg Leu Val Pro Trp 115 120 125		
Val Asn Gln Cys Leu Asn Ile Thr Gly Leu Thr Ala Val Thr Asp Ala 130 135 140		
Val Thr Asp Gly Tyr Ile Arg Arg Gly Tyr Ile Thr Ser Arg Ala Phe 145 150 155 160		
Leu Thr Glu Gln Asp Leu Ser Gly Gly Val Leu His Ile Thr Val Met 165 170 175		
Glu Gly Arg Leu Gln Gln Ile Arg Ala Glu Gly Ala Asp Leu Pro Ala 180 185 190		
Arg Thr Leu Lys Met Val Phe Pro Gly Met Glu Gly Lys Val Leu Asn 195 200 205		
Leu Arg Asp Ile Glu Gln Gly Met Glu Gln Ile Asn Arg Leu Arg Thr 210 215 220		
Glu Pro Val Gln Ile Glu Ile Ser Pro Gly Asp Arg Glu Gly Trp Ser 225 230 235 240		
Val Val Thr Leu Thr Ala Leu Pro Glu Trp Pro Val Thr Gly Ser Val 245 250 255		
Gly Ile Asp Asn Ser Gly Gln Lys Ser Thr Gly Thr Gly Gln Leu Asn 260 265 270		
Gly Val Leu Ser Phe Asn Asn Pro Leu Gly Leu Ala Asp Asn Trp Phe 275 280 285		

Val Ser Gly Gly Arg Ser Ser Asp Phe Ser Val Ser His Asp Ala Arg
290 295 300

Asn Phe Ala Ala Gly Val Ser Leu Pro Tyr Gly Tyr Thr Leu Val Asp
305 310 315 320

Tyr Thr Tyr Ser Trp Ser Asp Tyr Leu Ser Thr Ile Asp Asn Arg Gly
325 330 335

Trp Arg Trp Arg Ser Thr Gly Asp Leu Gln Thr His Arg Leu Gly Leu
340 345 350

Ser His Val Leu Phe Arg Asn Gly Asp Met Lys Thr Ala Leu Thr Gly
355 360 365

Gly Leu Gln His Arg Ile Ile His Asn Tyr Leu Asp Asp Val Leu Leu
370 375 380

Gln Gly Ser Ser Arg Lys Leu Thr Ser Phe Ser Val Gly Leu Asn His
385 390 395 400

Thr His Lys Phe Leu Gly Gly Val Gly Thr Leu Asn Pro Val Phe Thr
405 410 415

Arg Gly Met Pro Trp Phe Gly Ala Glu Ser Asp His Gly Lys Arg Gly
420 425 430

Asp Leu Pro Val Asn Gln Phe Arg Lys Trp Ser Val Ser Ala Ser Phe
435 440 445

Gln Arg Pro Val Thr Asp Arg Val Trp Trp Leu Thr Ser Ala Tyr Ala
450 455 460

Gln Trp Ser Pro Asp Arg Leu His Gly Val Glu Gln Leu Ser Leu Gly
465 470 475 480

Gly Glu Ser Ser Val Arg Gly Phe Lys Asp Gln Tyr Ile Ser Gly Asn
485 490 495

Asn Gly Gly Tyr Leu Arg Asn Glu Leu Ser Trp Ser Leu Phe Ser Leu
500 505 510

Pro Tyr Val Gly Thr Val Arg Ala Val Ala Ala Leu Asp Gly Gly Trp
515 520 525

Leu His Ser Asp Ser Asp Asp Pro Tyr Ser Ser Gly Thr Leu Trp Gly
530 535 540

Ala Ala Ala Gly Leu Ser Thr Thr Ser Gly His Val Ser Gly Ser Phe
545 550 555 560

Thr Ala Gly Leu Pro Leu Val Tyr Pro Asp Trp Leu Ala Pro Asp His
565 570 575

Leu Thr Val Tyr Trp Arg Val Ala Val Ala Phe
580 585

<210> 46

<211> 744

<212> PRT

<213> Escherichia coli

<400> 46

Met Asn Lys His Thr Leu Leu Leu Thr Val Leu Phe Leu Asn Leu Ile
1 5 10 15

Cys Thr Pro Val Phe Ala Gln Asn Trp Gln Val Ala Thr Phe Gly Gln
20 25 30

Ser Thr Asp Leu Asn Phe Ser Ser Leu Ile Asp Ser Ala Lys Ile Gly
35 40 45

Arg Asn Asn Ala Trp Leu Ala Gly Asn Asn Asn Phe Leu Glu Ala Gly
50 55 60

Lys Phe Tyr Thr Leu Pro Thr Asp Phe Phe Ile Glu Ser Arg Gly Gly
65 70 75 80

Lys Ile Ala Asn Ser His Asp Gly Met Thr Val Phe Tyr Thr Ile Val
85 90 95

Pro Val Thr Gln Thr Phe Arg Leu Glu Ala Asp Leu Thr Leu Glu Gln
100 105 110

Ile Gly Pro Glu Val Asn Gly Lys Ser Pro Ala Gly Gln Glu Gly Ala
115 120 125

Gly Leu Phe Val Arg Asp Ile Ile Gly Pro Gln Arg Gln Glu Pro Gln
130 135 140

Ser Ala Gly Thr Glu Glu Tyr Pro Gln Ala Ser Asn Ile Leu Met Asn
145 150 155 160

Ala Phe Ile Thr Gln Asn Lys Lys Asn Asp Asn Leu Val Gln Ile Thr
165 170 175

Ser Ile Val Arg Glu Gly Val Ile Lys Thr Trp Gly Asn Glu Gly Ile
180 185 190

Thr Ile Lys Lys Gln Pro Ile Ile Glu Asn Ile Asn Phe Thr Gln Lys
195 200 205

Arg Asn Ile His Met Thr Ile Glu Arg Leu Pro Glu Lys Phe Ile Leu
210 215 220

Thr Ala Phe Asp Thr Asp Arg Lys Glu Asn Gln Ser Trp Gln Phe Ser
225 230 235 240

Asp Tyr Ser Gly Phe Met Asn Gln Leu Asp Asn Asn Ser Leu Ala Ile
245 250 255

Gly Phe Phe Ala Ala Arg Asn Ala Lys Leu Arg Val Lys Asn Ala Ser
260 265 270

Phe Lys Pro Gly Lys Pro Leu Val Asp Tyr Lys Gln Leu Thr Ser Arg
275 280 285

Gln Phe Ser Arg Val Arg His Lys Ala Pro Glu Leu Phe Leu Ala Ser
290 295 300

Pro Gln Ser Val Val Arg Asn Ser Thr Thr Leu Gln Phe Leu Ala Asn
305 310 315 320

Gln Ala Gly Ile Val Ser Ile Asp Asn Asp Lys Gln Thr Lys Gln Val
325 330 335

Gln Ala Gly Glu Leu Val Gln Phe Pro Val Thr Leu Gln Lys Lys His
340 345 350

Asn Asp Phe Thr Val Asn Phe Asn Val Asp Gly Asn Ile Ser Lys Lys
355 360 365

Ala Ile Arg Ile Glu Gln Val Lys Ser Asn Leu Thr Asp Pro Tyr Glu
370 375 380

Ile Tyr Val Cys Ser Asp Cys Arg Gln Gly Ala Arg Gly Ser Lys Asn
385 390 395 400

Asp Pro Val Asp Leu Gln Thr Ala Val Lys Phe Val Ala Pro Gly Gly
405 410 415

Asn Ile Tyr Leu Asn Asp Gly Gln Tyr His Gly Ile Thr Leu Asp Arg
420 425 430

Glu Leu Ser Gly Ile Pro Gly Lys Tyr Lys Thr Ile Ser Ala Ile Asn
435 440 445

Pro His Lys Ala Ile Phe Ile Asn Lys Thr Phe Asn Leu Asp Ala Ser
450 455 460

Tyr Trp His Leu Lys Ser Val Val Phe Asp Gly Asn Val Asp Asn Gly
465 470 475 480

Asn Asn Lys Pro Ala Tyr Leu Arg Ile Ala Gly Ser Tyr Asn Ile Ile
485 490 495

Glu His Val Ile Ala Arg Asn Asn Asp Asp Thr Gly Ile Ser Ile Ser
500 505 510

Ala Lys Asp Lys Asn Arg Phe Phe Trp Pro Ala His Asn Leu Val Leu
515 520 525

Asn Ser Asp Ser Tyr Asn Asn Leu Asp Leu Ser Gly Ile Asn Ala Asp
530 535 540

Gly Phe Ala Ala Lys Leu Gly Val Gly Pro Gly Asn Ile Phe Arg Gly
545 550 555 560

Cys Ile Ala His Asn Asn Ala Asp Asp Gly Trp Asp Leu Phe Asn Lys
565 570 575

Ile Glu Asp Gly Pro Asn Ala Ser Val Thr Ile Glu Asn Ser Val Ala
580 585 590

Tyr Glu Asn Gly Leu Pro Tyr Asn Lys Ala Asp Ile Leu Lys Gly Ser
595 600 605

Ile Gly Asn Gly Gly Glu Gly Gln Pro Ser Lys Ser Gln Val Ile Asn
610 615 620

Ser Ile Ala Ile Asn Asn Asn Met Asp Gly Phe Thr Asp Asn Phe Asn
625 630 635 640

Thr Gly Ser Leu Ile Val Arg Asn Asn Ile Ala Met Asn Asn Ala Arg
645 650 655

Tyr Asn Tyr Ile Leu Arg Thr Asn Pro Tyr Lys Phe Pro Ser Ser Ile
660 665 670

Leu Phe Asp Asn Asn Tyr Ser Ile Arg Asp Asp Trp Glu Asn Lys Ile
675 680 685

Lys Asp Phe Leu Gly Asp Thr Val Asn Ser Val Asn Tyr Lys Leu Leu
690 695 700

Val Ser His Glu Thr Gly Pro Val Gln Lys Asp Leu Phe Phe Thr Arg
705 710 715 720

Asp Asp Ser Gly Asn Ile Ile Tyr Pro Asp Phe Phe Leu Asn Ile Ile
725 730 735

Asn Lys Phe Asn Glx Thr Met Pro
740

<210> 47

<211> 136

<212> PRT

<213> Escherichia coli

<400> 47

Met Lys Thr Phe Ile Lys Thr Leu Leu Val Ala Val Thr Ile Leu Phe
1 5 10 15

Ser Val Phe Ala Thr Ala Lys Gln Val Lys Leu Pro Asn Asn Ile Lys
20 25 30

Tyr Val Asn Thr Thr Glu Ala Phe Ser Cys Thr Glu Ile Asp Gly Met
35 40 45

Asn Cys Gln Thr Lys Asn Pro Phe Asn Tyr Lys Asp Asn Ser Tyr Val
50 55 60

Phe Val Leu Glu Arg Gly Gly Ala Trp Cys Tyr Asp Tyr Thr Val Ser
65 70 75 80

Val Leu Asn Leu Lys Thr Gly Lys Ala Gln Met Leu Glu Tyr Lys Asp
85 90 95

Asn Gln Leu Cys Ser Gly Ser Asn Lys Pro Phe Phe Glu Ile Lys Asn
100 105 110

Gly Val Pro Thr Val Gly Val Ile Asp Thr Ser Gly Lys Pro Val Val
115 120 125

Val Ala Leu Asp Lys Leu Lys Thr
130 135

<210> 48

<211> 225

<212> PRT

<213> Escherichia coli

<400> 48

Met Gln Leu Pro Val Lys Leu Leu Met Ser Leu Ile Ser Leu Val Ser
1 5 10 15

Val Ile Ala Arg Ala Gly Lys Tyr Lys Asn Tyr Ile Arg Asp Glu Ile
20 25 30

Lys Tyr Trp Arg Tyr Thr Ser Tyr Lys Gly Gly Glu Phe Pro Glu Gly
35 40 45

Phe Thr Asp Glu Lys Phe Ser Ser Ala Ile Tyr Asn Gly Arg Ile Phe
50 55 60

Thr Met Lys Arg Leu His Thr Leu Met Leu Phe Leu Ala Val Leu Phe
65 70 75 80

Thr Gly Phe Asn Val Glu Ala Ala Ser Val Lys Gln Ala Leu Ser Cys
85 90 95

Asp Pro Asn Ala Arg Ala Glu Gln Pro Gly Ala Cys Pro Thr Thr Tyr
100 105 110

Glu Leu Tyr Glu Gly Asp Ala Ala Tyr Lys Ala Ala Leu Asp Lys Ala
115 120 125

Leu Lys Pro Val Gly Leu Ser Gly Met Phe Gly Lys Gly Gly Tyr Met
130 135 140

Asp Gly Pro Gly Gly Asn Val Thr Pro Val Thr Ile Asn Gly Thr Val
145 150 155 160

Trp Leu Gln Gly Asp Gly Cys Lys Ala Asn Thr Cys Gly Trp Asp Phe
165 170 175

Ile Val Thr Leu Tyr Asn Pro Lys Thr His Glu Val Val Gly Tyr Arg
180 185 190

Tyr Phe Gly Leu Asp Asp Pro Ala Tyr Leu Val Trp Phe Gly Glu Ile
195 200 205

Gly Val His Glu Phe Ala Tyr Leu Val Lys Asn Tyr Val Ala Ala Val
210 215 220

Asn
225

<210> 49
<211> 721
<212> PRT
<213> Escherichia coli

<400> 49
Met Lys Thr Gln Ile Thr Phe Ala Ala Leu Leu Pro Ala Leu Ala Ser
1 5 10 15

Phe Ile Pro Leu His Ala His Ala Ser Ser Thr Ser Glu Asp Glu Met
20 25 30

Ile Val Thr Gly Asn Thr Ala Ala Asp Thr Thr Asp Ser Ala Ala Gly
35 40 45

Ala Gly Phe Lys Thr Asn Asp Ile Asp Val Gly Pro Leu Gly Thr Lys

50						55										60
Ser	Trp	Ile	Glu	Thr	Pro	Tyr	Ser	Ser	Thr	Thr	Val	Thr	Lys	Glu	Met	
65					70					75					80	
Ile	Glu	Asn	Gln	Gln	Ala	Gln	Ser	Val	Ser	Glu	Met	Leu	Lys	Tyr	Ser	
				85					90					95		
Pro	Ser	Thr	Gln	Met	Gln	Ala	Arg	Gly	Gly	Met	Asp	Val	Gly	Arg	Pro	
			100					105					110			
Gln	Ser	Arg	Gly	Met	Gln	Gly	Ser	Val	Val	Ala	Asn	Ser	Arg	Leu	Asp	
		115					120					125				
Gly	Leu	Asn	Ile	Val	Ser	Thr	Thr	Ala	Phe	Pro	Val	Glu	Met	Leu	Glu	
	130					135					140					
Arg	Met	Asp	Val	Leu	Asn	Ser	Leu	Thr	Gly	Ala	Leu	Tyr	Gly	Pro	Ala	
145					150					155					160	
Ser	Pro	Ala	Gly	Gln	Phe	Asn	Phe	Val	Ala	Lys	Arg	Pro	Thr	Glu	Glu	
				165					170					175		
Thr	Leu	Arg	Lys	Val	Thr	Leu	Gly	Tyr	Gln	Ser	Arg	Ser	Ala	Phe	Thr	
			180					185					190			
Gly	His	Ala	Asp	Leu	Gly	Gly	His	Phe	Asp	Glu	Asn	Lys	Arg	Phe	Gly	
		195					200					205				
Tyr	Arg	Val	Asn	Leu	Leu	Asp	Gln	Glu	Gly	Glu	Gly	Asn	Val	Asp	Asp	
	210					215					220					
Ser	Thr	Leu	Arg	Arg	Lys	Leu	Val	Ser	Val	Ala	Leu	Asp	Trp	Asn	Ile	
225					230					235					240	
Gln	Pro	Gly	Thr	Gln	Leu	Gln	Leu	Asp	Ala	Ser	His	Tyr	Glu	Phe	Ile	
				245					250					255		
Gln	Lys	Gly	Tyr	Val	Gly	Ser	Phe	Asn	Tyr	Gly	Pro	Asn	Val	Lys	Leu	
		260						265					270			
Pro	Ser	Ala	Pro	Asn	Pro	Lys	Asp	Lys	Asn	Leu	Ala	Leu	Ser	Thr	Ala	
		275					280					285				

Gly Asn Asp Leu Thr Thr Asp Thr Ile Ser Thr Arg Leu Ile His Tyr
290 295 300

Phe Asn Asp Asp Trp Ser Met Asn Ala Gly Val Gly Trp Gln Gln Ala
305 310 315 320

Asp Arg Ala Met Arg Ser Val Ser Ser Lys Ile Leu Asn Asn Gln Gly
325 330 335

Asp Ile Ser Arg Ser Met Lys Asp Ser Thr Ala Ala Gly Arg Phe Arg
340 345 350

Val Leu Ser Asn Thr Ala Gly Leu Asn Gly His Ile Asp Thr Gly Ser
355 360 365

Ile Gly His Asp Leu Ser Leu Ser Thr Thr Gly Tyr Val Trp Ser Leu
370 375 380

Tyr Ser Ala Lys Gly Thr Gly Ser Ser Tyr Ser Trp Gly Thr Thr Asn
385 390 395 400

Met Tyr His Pro Asp Ala Ile Asp Glu Gln Gly Asp Gly Lys Ile Arg
405 410 415

Thr Gly Gly Pro Arg Tyr Arg Ser Ser Val Asn Thr Gln Gln Ser Val
420 425 430

Thr Leu Gly Asp Thr Val Thr Phe Thr Pro Gln Trp Ser Ala Met Phe
435 440 445

Tyr Leu Ser Gln Ser Trp Leu Gln Thr Lys Asn Tyr Asp Lys His Gly
450 455 460

Asn Gln Thr Asn Gln Val Asp Glu Asn Gly Leu Ser Pro Asn Ala Ala
465 470 475 480

Leu Met Tyr Lys Ile Thr Pro Asn Thr Met Ala Tyr Val Ser Tyr Ala
485 490 495

Asp Ser Leu Glu Gln Gly Gly Thr Ala Pro Thr Asp Glu Ser Val Lys
500 505 510

Asn Ala Gly Gln Thr Leu Asn Pro Tyr Arg Ser Lys Gln Tyr Glu Val
515 520 525

Gly Leu Lys Ser Asp Ile Gly Glu Met Asn Leu Gly Ala Ala Leu Phe
530 535 540

Arg Leu Glu Arg Pro Phe Ala Tyr Leu Asp Thr Asp Asn Val Tyr Lys
545 550 555 560

Glu Gln Gly Asn Gln Val Asn Asn Gly Leu Glu Leu Thr Ala Ala Gly
565 570 575

Asn Val Trp Gln Gly Leu Asn Ile Tyr Ser Gly Val Thr Phe Leu Asp
580 585 590

Pro Lys Leu Lys Asp Thr Ala Asn Ala Ser Thr Ser Asn Lys Gln Val
595 600 605

Val Gly Val Pro Lys Val Gln Ala Asn Leu Leu Ala Glu Tyr Ser Leu
610 615 620

Pro Ser Ile Pro Glu Trp Val Tyr Ser Ala Asn Val His Tyr Thr Gly
625 630 635 640

Lys Arg Ala Ala Asn Asp Thr Asn Thr Ser Tyr Ala Ser Ser Tyr Thr
645 650 655

Thr Trp Asp Leu Gly Thr Arg Tyr Thr Thr Lys Val Ser Asn Val Pro
660 665 670

Thr Thr Phe Arg Val Val Val Asn Asn Val Phe Asp Lys His Tyr Trp
675 680 685

Ala Ser Ile Phe Pro Ser Gly Thr Asp Gly Asp Asn Gly Ser Pro Ser
690 695 700

Ala Phe Ile Gly Gly Gly Arg Glu Val Arg Ala Ser Val Thr Phe Asp
705 710 715 720

Phe

<210> 50
<211> 669
<212> PRT
<213> Escherichia coli

<400> 50

Met	Lys	Asn	Ile	Thr	Leu	Trp	Gln	Arg	Leu	Arg	Gln	Val	Ser	Ile	Ser
1				5					10					15	

Thr	Ser	Leu	Arg	Cys	Ala	Phe	Leu	Met	Gly	Ala	Leu	Leu	Thr	Leu	Ile
			20					25					30		

Val	Ser	Ser	Val	Ser	Leu	Tyr	Ser	Trp	His	Glu	Gln	Ser	Ser	Gln	Ile
		35					40					45			

Arg	Tyr	Ser	Leu	Asp	Lys	Tyr	Phe	Pro	Arg	Ile	His	Ser	Ala	Phe	Leu
	50					55					60				

Ile	Glu	Gly	Asn	Leu	Asn	Leu	Val	Val	Asp	Gln	Leu	Asn	Glu	Phe	Leu
65					70					75					80

Gln	Ala	Pro	Asn	Thr	Thr	Val	Arg	Leu	Gln	Leu	Arg	Thr	Gln	Ile	Ile
				85					90					95	

Gln	His	Leu	Asp	Thr	Ile	Glu	Arg	Leu	Ser	Arg	Gly	Leu	Ser	Ser	Arg
			100					105					110		

Glu	Arg	Gln	Gln	Leu	Thr	Val	Ile	Leu	Gln	Asp	Ser	Arg	Ser	Leu	Leu
		115					120					125			

Ser	Glu	Leu	Asp	Arg	Ala	Leu	Tyr	Asn	Met	Phe	Leu	Leu	Arg	Glu	Lys
	130					135					140				

Val	Ser	Glu	Leu	Ser	Ala	Arg	Ile	Asp	Trp	Leu	His	Asp	Asp	Phe	Thr
145					150					155					160

Thr	Glu	Leu	Asn	Ser	Leu	Val	Gln	Asp	Phe	Thr	Trp	Gln	Gln	Gly	Thr
				165					170					175	

Leu	Leu	Asp	Gln	Ile	Ala	Ser	Arg	Gln	Gly	Asp	Thr	Ala	Gln	Tyr	Leu
			180					185					190		

Lys	Arg	Ser	Arg	Glu	Val	Gln	Asn	Glu	Gln	Gln	Gln	Val	Tyr	Thr	Leu
		195					200					205			

Ala Arg Ile Glu Asn Gln Ile Val Asp Asp Leu Arg Asp Arg Leu Asn
210 215 220

Glu Leu Lys Ser Gly Arg Asp Asp Asp Ile Gln Val Glu Thr His Leu
225 230 235 240

Arg Tyr Phe Glu Asn Leu Lys Lys Thr Ala Asp Glu Asn Ile Arg Met
245 250 255

Leu Asp Asp Trp Pro Gly Thr Ile Thr Leu Arg Gln Thr Ile Asp Glu
260 265 270

Leu Leu Asp Met Gly Ile Val Lys Asn Lys Met Pro Asp Thr Met Arg
275 280 285

Glu Tyr Val Ala Ala Gln Lys Ala Leu Glu Asp Ala Ser Arg Thr Arg
290 295 300

Glu Ala Thr Gln Gly Arg Phe Arg Thr Leu Leu Glu Ala Gln Leu Gly
305 310 315 320

Ser Thr His Gln Gln Met Gln Met Phe Asn Gln Arg Met Glu Gln Ile
325 330 335

Val His Val Ser Gly Gly Leu Ile Leu Val Ala Thr Ala Leu Ala Leu
340 345 350

Leu Leu Ala Trp Val Phe Asn His Tyr Phe Ile Arg Ser Arg Leu Val
355 360 365

Lys Arg Phe Thr Leu Leu Asn Gln Ala Val Val Gln Ile Gly Leu Gly
370 375 380

Gly Thr Glu Thr Thr Ile Pro Val Tyr Gly Asn Asp Glu Leu Gly Arg
385 390 395 400

Ile Ala Gly Leu Leu Arg His Thr Leu Gly Gln Leu Asn Val Gln Lys
405 410 415

Gln Gln Leu Glu Gln Glu Ile Thr Asp Arg Lys Val Ile Glu Ala Asp
420 425 430

Leu Arg Ala Thr Gln Asp Glu Leu Ile Gln Thr Ala Lys Leu Ala Val
435 440 445

Val Gly Gln Thr Met Thr Thr Leu Ala His Glu Ile Asn Gln Pro Leu
450 455 460

Asn Ala Leu Ser Met Tyr Leu Phe Thr Ala Arg Arg Ala Ile Glu Gln
465 470 475 480

Thr Gln Lys Glu Gln Ala Ser Met Met Leu Gly Lys Ala Glu Gly Val
485 490 495

Ile Ser Arg Ile Asp Ala Ile Ile Arg Ser Leu Arg Gln Phe Thr Arg
500 505 510

Arg Ala Glu Leu Glu Thr Ser Leu His Ala Val Asp Leu Ala Gln Met
515 520 525

Phe Ser Ala Ala Trp Glu Leu Leu Ala Met Arg His Arg Ser Leu Gln
530 535 540

Ala Thr Leu Val Leu Pro Gln Gly Thr Ala Thr Val Ser Gly Asp Glu
545 550 555 560

Val Arg Thr Gln Gln Val Leu Val Asn Val Leu Ala Asn Ala Leu Asp
565 570 575

Val Cys Gly Gln Gly Ala Val Ile Thr Val Asn Trp Gln Met Gln Gly
580 585 590

Lys Thr Leu Asn Val Phe Ile Gly Asp Asn Gly Pro Gly Trp Pro Glu
595 600 605

Ala Leu Leu Pro Ser Leu Leu Lys Pro Phe Thr Thr Ser Lys Glu Val
610 615 620

Gly Leu Gly Ile Gly Leu Ser Ile Cys Val Ser Leu Met Glu Gln Met
625 630 635 640

Lys Gly Glu Leu Arg Leu Ala Ser Thr Met Thr Arg Asn Ala Cys Val
645 650 655

Val Leu Gln Phe Arg Leu Thr Asp Val Glu Asp Ala Lys
660 665

<210> 51
<211> 753
<212> PRT
<213> Escherichia coli

<400> 51
Met Asn Val Ile Lys Leu Ala Ile Gly Ser Gly Ile Leu Leu Leu Ser
1 5 10 15

Cys Gly Ala Tyr Ser Gln Ser Ile Ser Glu Lys Thr Asn Ser Asp Lys
20 25 30

Lys Gly Ala Ala Glu Phe Ser Pro Leu Ser Val Ser Val Gly Lys Thr
35 40 45

Thr Ser Glu Gln Glu Ala Leu Glu Lys Thr Gly Ala Thr Ser Ser Arg
50 55 60

Thr Thr Asp Lys Asn Leu Gln Ser Leu Asp Ala Thr Val Arg Ser Met
65 70 75 80

Pro Gly Thr Tyr Thr Gln Ile Asp Pro Gly Gln Gly Ala Ile Ser Val
85 90 95

Asn Ile Arg Gly Met Ser Gly Phe Gly Arg Val Asn Thr Met Val Asp
100 105 110

Gly Ile Thr Gln Ser Phe Tyr Gly Thr Ser Thr Ser Gly Thr Thr Thr
115 120 125

His Gly Ser Thr Asn Asn Met Ala Gly Val Leu Ile Asp Pro Asn Leu
130 135 140

Leu Val Ala Val Asp Val Thr Arg Gly Asp Ser Ser Gly Ser Glu Gly
145 150 155 160

Ile Asn Ala Leu Ala Gly Ser Ala Asn Met Arg Thr Ile Gly Val Asp
165 170 175

Asp Val Ile Phe Asn Gly Asn Thr Tyr Gly Leu Arg Ser Arg Phe Ser

				180					185					190			
Val	Gly	Ser	Asn	Gly	Leu	Gly	Arg	Ser	Gly	Met	Ile	Ala	Leu	Gly	Gly		
		195					200					205					
Lys	Ser	Asp	Ala	Phe	Thr	Asp	Thr	Gly	Ser	Ile	Gly	Val	Met	Ala	Ala		
		210					215				220						
Val	Ser	Gly	Ser	Ser	Val	Tyr	Ser	Asn	Phe	Ser	Asn	Gly	Ser	Gly	Ile		
225					230					235					240		
Asn	Ser	Lys	Glu	Phe	Gly	Tyr	Asp	Lys	Tyr	Met	Lys	Gln	Asn	Pro	Lys		
				245					250					255			
Ser	Gln	Leu	Tyr	Lys	Met	Asp	Ile	Arg	Pro	Asp	Glu	Phe	Asn	Ser	Phe		
			260					265					270				
Glu	Leu	Ser	Ala	Arg	Thr	Tyr	Glu	Asn	Lys	Phe	Thr	Arg	Arg	Asp	Ile		
		275					280					285					
Thr	Ser	Asp	Asp	Tyr	Tyr	Ile	Lys	Tyr	His	Tyr	Thr	Pro	Phe	Ser	Glu		
		290				295					300						
Leu	Ile	Asp	Phe	Asn	Val	Thr	Ala	Ser	Thr	Ser	Arg	Gly	Asn	Gln	Lys		
305					310					315					320		
Tyr	Arg	Asp	Gly	Ser	Leu	Tyr	Thr	Phe	Tyr	Lys	Thr	Ser	Ala	Gln	Asn		
				325					330					335			
Arg	Ser	Asp	Ala	Leu	Asp	Ile	Asn	Asn	Thr	Ser	Arg	Phe	Thr	Val	Ala		
			340					345					350				
Asp	Asn	Asp	Leu	Glu	Phe	Met	Leu	Gly	Ser	Lys	Leu	Met	Arg	Thr	Arg		
		355					360					365					
Tyr	Asp	Arg	Thr	Ile	His	Ser	Ala	Ala	Gly	Asp	Pro	Lys	Ala	Asn	Gln		
		370				375					380						
Glu	Ser	Ile	Glu	Asn	Asn	Pro	Phe	Ala	Pro	Ser	Gly	Gln	Gln	Asp	Ile		
385					390					395					400		
Ser	Ala	Leu	Tyr	Thr	Gly	Leu	Lys	Val	Thr	Arg	Gly	Ile	Trp	Glu	Ala		

				405						410						415
Asp	Phe	Asn	Leu	Asn	Tyr	Thr	Arg	Asn	Arg	Ile	Thr	Gly	Tyr	Lys	Pro	
			420					425					430			
Ala	Cys	Asp	Ser	Arg	Val	Ile	Cys	Val	Pro	Gln	Gly	Ser	Tyr	Asp	Ile	
		435					440					445				
Asp	Asp	Lys	Glu	Gly	Gly	Phe	Asn	Pro	Ser	Val	Gln	Leu	Ser	Ala	Gln	
	450					455					460					
Val	Thr	Pro	Trp	Leu	Gln	Pro	Phe	Ile	Gly	Tyr	Ser	Lys	Ser	Met	Arg	
465					470					475					480	
Ala	Pro	Asn	Ile	Gln	Glu	Met	Phe	Phe	Ser	Asn	Ser	Gly	Gly	Ala	Ser	
				485					490					495		
Met	Asn	Pro	Phe	Leu	Lys	Pro	Glu	Arg	Ala	Glu	Thr	Trp	Gln	Ala	Gly	
			500					505					510			
Phe	Asn	Ile	Asp	Thr	Arg	Asp	Leu	Leu	Val	Glu	Gln	Asp	Ala	Leu	Arg	
		515					520					525				
Phe	Lys	Ala	Leu	Ala	Tyr	Arg	Ser	Arg	Ile	Gln	Asn	Tyr	Ile	Tyr	Ser	
	530					535					540					
Glu	Ser	Tyr	Leu	Val	Cys	Ser	Gly	Gly	Arg	Lys	Cys	Ser	Leu	Pro	Glu	
545					550					555					560	
Val	Ile	Gly	Asn	Gly	Trp	Glu	Gly	Ile	Ser	Asp	Glu	Tyr	Ser	Asp	Asn	
				565					570					575		
Met	Tyr	Ile	Tyr	Val	Asn	Ser	Ala	Ser	Asp	Val	Ile	Ala	Lys	Gly	Phe	
			580					585					590			
Glu	Leu	Glu	Met	Asp	Tyr	Asp	Ala	Gly	Phe	Ala	Phe	Gly	Arg	Leu	Ser	
		595					600					605				
Phe	Ser	Gln	Gln	Gln	Thr	Asp	Gln	Pro	Thr	Ser	Ile	Ala	Ser	Thr	His	
	610					615					620					
Phe	Gly	Ala	Gly	Asp	Ile	Thr	Glu	Leu	Pro	Arg	Lys	Tyr	Met	Thr	Leu	
625					630					635					640	

Asp Thr Gly Val Arg Phe Phe Asp Asn Ala Leu Thr Leu Gly Thr Ile
645 650 655

Ile Lys Tyr Thr Gly Lys Ala Arg Arg Leu Ser Pro Asp Phe Glu Gln
660 665 670

Asp Glu His Thr Gly Ala Ile Ile Lys Gln Asp Leu Pro Gln Ile Pro
675 680 685

Thr Ile Ile Asp Leu Tyr Gly Thr Tyr Glu Tyr Asn Arg Asn Leu Thr
690 695 700

Leu Lys Leu Ser Val Gln Asn Leu Met Asn Arg Asp Tyr Ser Glu Ala
705 710 715 720

Leu Asn Lys Leu Asn Met Met Pro Gly Leu Gly Asp Glu Thr His Pro
725 730 735

Ala Asn Ser Ala Arg Gly Arg Thr Trp Ile Phe Gly Gly Asp Ile Arg
740 745 750

Phe

<210> 52
<211> 133
<212> PRT
<213> Escherichia coli

<400> 52
Met Ser Ser Lys Thr Lys Cys Trp Leu Trp Met Leu Leu Val Ile Leu
1 5 10 15

Ser Glu Thr Ser Ala Thr Ser Thr Leu Lys Met Phe Asp Asn Ser Glu
20 25 30

Gly Met Thr Lys Thr Leu Leu Leu Ala Leu Ile Val Val Leu Tyr Cys
35 40 45

Ile Cys Tyr Tyr Ser Leu Ser Arg Ala Val Lys Asp Ile Pro Val Gly
50 55 60

Leu Ala Tyr Ala Thr Trp Ser Gly Thr Gly Ile Leu Met Val Ser Thr

65																	
Leu	Gly	Ile	Leu	Phe	Tyr	Gly	Gln	His	Pro	Asp	Thr	Ala	Ala	Ile	Ile		
				85					90					95			
Gly	Met	Val	Ile	Ile	Ala	Ser	Gly	Ile	Ile	Ile	Met	Asn	Leu	Phe	Ser		
			100					105					110				
Lys	Met	Gly	Ser	Glu	Glu	Ala	Glu	Glu	Thr	Pro	Val	Thr	Asn	Leu	Asp		
		115					120					125					
Lys	Lys	Ile	Ala	Asn													
		130															
<210> 53																	
<211> 286																	
<212> PRT																	
<213> Escherichia coli																	
<400> 53																	
Met	Tyr	Ile	Lys	Lys	His	Trp	Ile	Ala	Leu	Ser	Ile	Leu	Leu	Ile	Pro		
1				5					10					15			
Cys	Ile	Gly	Asn	Ala	Gln	Glu	Ile	Lys	Ile	Asp	Glu	Ser	Trp	Leu	His		
			20					25					30				
Gln	Ser	Leu	Asn	Val	Ile	Gly	Arg	Thr	Asp	Ser	Arg	Phe	Gly	Pro	Arg		
		35					40					45					
Leu	Thr	Asn	Asp	Leu	Tyr	Pro	Glu	Tyr	Thr	Val	Ala	Gly	Arg	Lys	Asp		
	50					55					60						
Trp	Phe	Asp	Phe	Tyr	Gly	Tyr	Val	Asp	Leu	Pro	Lys	Phe	Phe	Gly	Val		
65					70					75				80			
Gly	Ser	His	Tyr	Asp	Val	Gly	Ile	Trp	Asp	Glu	Gly	Ser	Pro	Leu	Phe		
				85					90					95			
Thr	Glu	Ile	Glu	Pro	Arg	Phe	Ser	Ile	Asp	Lys	Leu	Thr	Gly	Leu	Asn		
			100					105					110				
Leu	Ala	Phe	Gly	Pro	Phe	Lys	Glu	Trp	Phe	Ile	Ala	Asn	Asn	Tyr	Val		
		115					120					125					

Tyr Asp Met Gly Asp Asn Gln Ser Ser Arg Gln Ser Thr Trp Tyr Met
130 135 140

Gly Leu Gly Thr Asp Ile Asp Thr Gly Leu Pro Ile Lys Leu Ser Ala
145 150 155 160

Asn Ile Tyr Ala Lys Tyr Gln Trp Gln Asn Tyr Gly Ala Ala Asn Glu
165 170 175

Asn Glu Trp Asp Gly Tyr Arg Phe Lys Ile Lys Tyr Ser Ile Pro Leu
180 185 190

Thr Asn Leu Phe Gly Gly Arg Leu Val Tyr Asn Ser Phe Thr Asn Phe
195 200 205

Asp Phe Gly Ser Asp Leu Ala Asp Lys Ser His Asn Asn Lys Arg Thr
210 215 220

Ser Asn Ala Ile Ala Ser Ser His Ile Leu Ser Leu Leu Tyr Glu His
225 230 235 240

Trp Lys Phe Ala Phe Thr Leu Arg Tyr Phe His Asn Gly Gly Gln Trp
245 250 255

Asn Ala Gly Glu Lys Val Asn Phe Gly Asp Gly Pro Phe Glu Leu Lys
260 265 270

Asn Thr Gly Trp Gly Thr Tyr Thr Thr Ile Gly Tyr Gln Phe
275 280 285

<210> 54

<211> 172

<212> PRT

<213> Escherichia coli

<400> 54

Met Arg Ile Ala Pro Arg Thr Phe Phe Ala Ile Ser Ala Leu Ala Phe
1 5 10 15

Ile Val Ala Ser Gly Phe Ser Phe Trp Arg Leu Ser Pro Ala Glu Asn
20 25 30

Thr Gly Ile Met Ser Cys Ser Thr Lys Gly Ile Met Arg Phe Glu Asn
35 40 45

Met Glu Lys Glu Asn Val Asn Gly Asn Ile His Phe Asn Phe Gly Ser
50 55 60

Gln Gly Lys Gly Ser Met Val Leu Glu Gly Tyr Thr Asp Ser Ala Ala
65 70 75 80

Gly Trp Leu Tyr Leu Gln Arg Tyr Val Lys Phe Thr Tyr Thr Ser Lys
85 90 95

Arg Val Ser Ala Thr Glu Arg His Tyr Arg Ile Ser Gln Trp Glu Ser
100 105 110

Ser Ala Ser Ser Ile Asp Glu Ser Pro Asp Val Ile Phe Asp Tyr Phe
115 120 125

Met Arg Glu Met Ser Asp Ser His Asp Gly Leu Phe Leu Asn Ala Gln
130 135 140

Lys Leu Asn Asp Lys Ala Ile Leu Leu Ser Ser Ile Asn Ser Pro Leu
145 150 155 160

Trp Ile Cys Thr Leu Lys Ser Gly Ser Lys Leu Asp
165 170

<210> 55

<211> 182

<212> PRT

<213> Escherichia coli

<400> 55

Met Lys Ile Lys Val Ile Ala Leu Ala Thr Phe Val Ser Ala Val Phe
1 5 10 15

Ala Gly Ser Ala Met Ala Tyr Asp Gly Thr Ile Thr Phe Thr Gly Lys
20 25 30

Val Val Ala Gln Thr Cys Thr Val Asn Thr Ser Asp Lys Asp Leu Ala
35 40 45

Val Thr Leu Pro Thr Val Ala Thr Ser Ser Leu Lys Asp Asn Ala Ala
50 55 60

Thr Ser Gly Leu Thr Pro Phe Ala Ile Arg Leu Thr Gly Cys Ala Thr

65					70						75				80
Gly	Met	Asn	Ser	Ala	Gln	Asn	Val	Lys	Ala	Tyr	Phe	Glu	Pro	Ser	Ser
				85					90					95	
Asn	Ile	Asp	Leu	Ala	Thr	His	Asn	Leu	Lys	Asn	Thr	Ala	Thr	Pro	Thr
			100					105					110		
Lys	Ala	Asp	Asn	Val	Gln	Ile	Gln	Leu	Leu	Asn	Ser	Asn	Gly	Thr	Ser
		115					120					125			
Thr	Ile	Leu	Leu	Gly	Glu	Ala	Asp	Asn	Gly	Gln	Asp	Val	Gln	Ser	Glu
	130					135					140				
Thr	Ile	Gly	Ser	Asp	Gly	Ser	Ala	Thr	Leu	Arg	Tyr	Met	Ala	Gln	Tyr
145					150					155					160
Tyr	Ala	Thr	Gly	Gln	Ser	Thr	Ala	Gly	Asp	Val	Lys	Ala	Thr	Val	His
				165					170					175	
Tyr	Thr	Ile	Ala	Tyr	Glu										
			180												

<210> 56
 <211> 359
 <212> PRT
 <213> Escherichia coli

<400> 56
 Met Lys Arg Ile Phe Phe Ile Pro Leu Phe Leu Ile Leu Leu Pro Lys
 1 5 10 15

Leu Ala Val Ala Gly Pro Asp Asp Tyr Val Pro Ser Gln Ile Ala Val
 20 25 30

Asn Thr Ser Thr Leu Pro Gly Val Val Ile Gly Pro Ala Asp Ala His
 35 40 45

Thr Tyr Pro Arg Val Ile Gly Glu Leu Ala Gly Thr Ser Asn Gln Tyr
 50 55 60

Val Phe Asn Gly Gly Ala Ile Ala Leu Met Arg Gly Lys Phe Thr Pro
 65 70 75 80

Ala Leu Pro Lys Ile Gly Ser Ile Thr Val Tyr Phe Pro Ser Arg Lys
85 90 95

Gln Arg Asp Ser Ser Asp Phe Asp Ile Tyr Asp Ile Gly Val Ser Gly
100 105 110

Leu Gly Ile Ile Ile Gly Met Ala Gly Tyr Trp Pro Ala Thr Pro Leu
115 120 125

Val Pro Ile Asn Ser Ser Gly Ile Tyr Ile Asp Pro Val Gly Ala Asn
130 135 140

Thr Asn Pro Asn Thr Tyr Asn Gly Ala Thr Ala Ser Phe Gly Ala Arg
145 150 155 160

Leu Phe Val Ala Phe Val Ala Thr Gly Arg Leu Pro Asn Gly Tyr Ile
165 170 175

Thr Ile Pro Thr Arg Gln Leu Gly Thr Ile Leu Leu Glu Ala Lys Arg
180 185 190

Thr Ser Leu Asn Asn Lys Gly Leu Thr Ala Pro Val Met Leu Asn Gly
195 200 205

Gly Arg Ile Gln Val Gln Ser Gln Thr Cys Thr Met Gly Gln Lys Asn
210 215 220

Tyr Val Val Pro Leu Asn Thr Val Tyr Gln Ser Gln Phe Thr Ser Leu
225 230 235 240

Tyr Lys Glu Ile Gln Gly Gly Lys Ile Asp Ile His Leu Gln Cys Pro
245 250 255

Asp Gly Ile Asp Val Tyr Ala Thr Leu Thr Asp Ala Ser Gln Pro Val
260 265 270

Asn Arg Thr Asp Ile Leu Thr Leu Ser Ser Glu Ser Thr Ala Lys Gly
275 280 285

Phe Gly Ile Arg Leu Tyr Lys Asp Ser Asp Val Thr Ala Ile Ser Tyr
290 295 300

Gly Glu Asp Ser Pro Val Lys Gly Asn Gly Ser Gln Trp His Phe Ser
305 310 315 320

Asp Tyr Arg Gly Glu Val Asn Pro His Ile Asn Leu Arg Ala Asn Tyr
325 330 335

Ile Lys Ile Ala Asp Ala Thr Thr Pro Gly Ser Val Lys Ala Ile Ala
340 345 350

Thr Ile Thr Phe Ser Tyr Gln
355

<210> 57

<211> 844

<212> PRT

<213> Escherichia coli

<400> 57

Met Asn Ala Asn Asn Leu Ser Cys Leu Ile Tyr Cys Arg Cys Ser Leu
1 5 10 15

Leu Leu Phe Ala Ala Leu Gly Leu Thr Val Thr Asn His Ser Phe Ala
20 25 30

Ala Glu Glu Ala Glu Phe Asp Ser Glu Phe Leu His Leu Asp Lys Gly
35 40 45

Ile Asn Ala Ile Asp Ile Arg Arg Phe Ser His Gly Asn Pro Val Pro
50 55 60

Glu Gly Arg Tyr Tyr Ser Asp Ile Tyr Val Asn Asn Val Trp Lys Gly
65 70 75 80

Lys Ala Asp Leu Gln Tyr Leu Arg Thr Ala Asn Thr Gly Ala Pro Thr
85 90 95

Leu Cys Leu Thr Pro Glu Leu Leu Ser Leu Ile Asp Leu Val Lys Asp
100 105 110

Thr Met Ser Gly Asn Thr Ser Cys Phe Pro Ala Ser Thr Gly Leu Ser
115 120 125

Ser Ala Arg Ile Asn Phe Asp Leu Ser Thr Leu Arg Leu Asn Ile Glu
130 135 140

Ile Pro Gln Ala Leu Leu Asn Thr Arg Pro Arg Gly Tyr Ile Ser Pro
145 150 155 160

Ala Gln Trp Gln Ser Gly Val Pro Ala Ala Phe Ile Asn Tyr Asp Ala
165 170 175

Asn Tyr Tyr Gln Tyr Ser Ser Ser Gly Thr Ser Asn Glu Gln Thr Tyr
180 185 190

Leu Gly Leu Lys Ala Gly Phe Asn Leu Trp Gly Trp Ala Leu Arg His
195 200 205

Arg Gly Ser Glu Ser Trp Asn Asn Ser Tyr Pro Ala Gly Tyr Gln Asn
210 215 220

Ile Glu Thr Ser Ile Met His Asp Leu Ala Pro Leu Arg Ala Gln Phe
225 230 235 240

Thr Leu Gly Asp Phe Tyr Thr Asn Gly Glu Leu Met Asp Ser Leu Ser
245 250 255

Leu Arg Gly Val Arg Leu Ala Ser Asp Glu Arg Met Leu Pro Gly Ser
260 265 270

Leu Arg Gly Tyr Ala Pro Ala Val Arg Gly Ile Ala Asn Ser Asn Ala
275 280 285

Lys Val Thr Ile Tyr Gln Asn Ala His Ile Leu Tyr Glu Thr Thr Val
290 295 300

Pro Ala Gly Pro Phe Val Ile Asn Asp Leu Tyr Pro Ser Gly Tyr Ala
305 310 315 320

Gly Asp Leu Leu Val Lys Ile Thr Glu Ser Asn Gly Gln Thr Arg Met
325 330 335

Phe Thr Val Pro Phe Ala Ala Val Ala Gln Leu Ile Arg Pro Gly Phe
340 345 350

Ser Arg Trp Gln Met Ser Val Gly Lys Tyr Arg Tyr Ala Asn Lys Thr
355 360 365

Tyr Asn Asp Leu Ile Ala Gln Gly Thr Tyr Gln Tyr Gly Leu Thr Asn
370 375 380

Asp Ile Thr Leu Asn Ser Gly Leu Thr Thr Ala Ser Gly Tyr Thr Ala
385 390 395 400

Gly Leu Ala Gly Leu Ala Phe Asn Thr Pro Leu Gly Ala Ile Ala Ser
405 410 415

Asp Ile Thr Leu Ser Arg Thr Ala Phe Arg Tyr Ser Gly Val Thr Arg
420 425 430

Lys Gly Tyr Ser Leu His Ser Ser Tyr Ser Ile Asn Ile Pro Ala Ser
435 440 445

Asn Thr Asn Ile Thr Leu Ala Ala Tyr Arg Tyr Ser Ser Lys Asp Phe
450 455 460

Tyr His Leu Lys Asp Ala Leu Ser Ala Asn His Asn Ala Phe Ile Asp
465 470 475 480

Asp Val Ser Val Lys Ser Thr Ala Phe Tyr Arg Pro Arg Asn Gln Phe
485 490 495

Gln Ile Ser Ile Asn Gln Glu Leu Gly Glu Lys Trp Gly Gly Met Tyr
500 505 510

Leu Thr Gly Thr Thr Tyr Asn Tyr Trp Gly His Lys Gly Ser Arg Asn
515 520 525

Glu Tyr Gln Ile Gly Tyr Ser Asn Phe Trp Lys Gln Leu Gly Tyr Gln
530 535 540

Ile Gly Leu Ser Gln Ser Arg Asp Asn Glu Gln Gln Arg Arg Asp Asp
545 550 555 560

Arg Phe Tyr Ile Asn Phe Thr Leu Pro Leu Gly Gly Ser Val Gln Ser
565 570 575

Pro Val Phe Ser Thr Val Leu Asn Tyr Ser Lys Glu Glu Lys Asn Ser
580 585 590

Ile Gln Thr Ser Ile Ser Gly Thr Gly Gly Glu Asp Asn Gln Phe Ser
595 600 605

Tyr Gly Ile Ser Gly Asn Ser Gln Glu Asn Gly Pro Ser Gly Tyr Ala
610 615 620

Met Asn Gly Gly Tyr Arg Ser Pro Tyr Val Asn Ile Thr Thr Thr Val
625 630 635 640

Gly His Asp Thr Gln Asn Asn Asn Gln Arg Ser Phe Gly Ala Ser Gly
645 650 655

Ala Val Val Ala His Pro Tyr Gly Val Thr Leu Ser Asn Asp Leu Ser
660 665 670

Asp Thr Phe Ala Ile Ile His Ala Glu Gly Ala Gln Gly Ala Val Ile
675 680 685

Asn Asn Ala Ser Gly Ser Arg Leu Asp Phe Trp Gly Asn Gly Val Val
690 695 700

Pro Tyr Val Thr Pro Tyr Glu Lys Asn Gln Ile Ser Ile Asp Pro Ser
705 710 715 720

Asn Leu Asp Leu Asn Val Glu Leu Ser Ala Thr Glu Gln Glu Ile Ile
725 730 735

Pro Arg Ala Asn Ser Ala Thr Leu Val Lys Phe Asp Thr Lys Thr Gly
740 745 750

Arg Ser Leu Leu Phe Asp Ile Arg Met Ser Thr Gly Asn Pro Pro Pro
755 760 765

Met Ala Ser Glu Val Leu Asp Glu His Gly Gln Leu Ala Gly Tyr Val
770 775 780

Ala Gln Ala Gly Lys Val Phe Thr Arg Gly Leu Pro Glu Lys Gly His
785 790 795 800

Leu Ser Val Val Trp Gly Pro Asp Asn Lys Asp Arg Cys Ser Phe Val
805 810 815

Tyr His Val Ala His Asn Lys Asp Asp Met Gln Ser Gln Leu Val Pro
820 825 830

Val Leu Cys Ile Gln His Pro Asn Gln Glu Lys Thr
835 840

<210> 58

<211> 277

<212> PRT

<213> Escherichia coli

<400> 58

Met Val Lys Cys His Thr Leu Ile Asn Arg Arg Asn Lys Cys Leu Leu
1 5 10 15

Ile Val Phe Ile Val Leu Ile Gly Trp Ile Ile Phe Arg Pro Lys Ala
20 25 30

Tyr Thr Tyr Ser Leu Asn Asp Lys Glu Lys Glu Met Leu Ile Met Leu
35 40 45

Ser Gln His Pro Glu Thr Arg Tyr Phe Gly Phe Tyr Ser Ile Glu Leu
50 55 60

Pro Ala Asp Tyr Lys Pro Thr Gly Met Val Met Phe Ile Gln Gly Ser
65 70 75 80

Ala Met Ile Pro Val Glu Thr Lys Leu Gln Tyr Tyr Pro Pro Phe Leu
85 90 95

Gln Tyr Met Thr Arg Tyr Glu Ala Glu Leu Lys Asn Thr Ser Ala Leu
100 105 110

Asp Pro Leu Asp Thr Pro Tyr Leu Lys Gln Val His Pro Leu Ser Pro
115 120 125

Pro Met Asn Gly Val Ile Phe Glu Arg Met Lys Ala Lys Tyr Thr Pro
130 135 140

Asp Phe Ala Arg Val Leu Asp Ala Trp Lys Trp Glu Asn Gly Val Thr
145 150 155 160

Phe Ser Val Lys Ile Glu Ala Lys Asp Gly Arg Ala Thr Arg Tyr Asp
165 170 175

Gly Ile Ser Lys Ile Ala Glu Tyr Ser Tyr Gly Tyr Asn Ile Pro Glu
180 185 190

Lys Lys Val Gln Leu Leu Thr Ile Leu Ser Gly Leu Gln Pro Arg Ala
195 200 205

Asp Asn Gln Pro Pro Ser Glu Asn Lys Leu Ala Ile Gln Tyr Ala Gln
210 215 220

Val Asp Ala Ser Leu Leu Gly Glu Tyr Glu Leu Ser Val Asp Tyr Lys
225 230 235 240

Asn Ser Asn Asn Ile Lys Ile Ser Leu Gln Thr Asp Asn Asn Ser Tyr
245 250 255

Ile Asp Ser Leu Leu Asp Ile Arg Tyr Pro Ser Asn Gly Asn Arg Ala
260 265 270

Trp Tyr Asn Ser Ile
275

<210> 59

<211> 366

<212> PRT

<213> Escherichia coli

<400> 59

Met Leu Pro Glu Pro Val Tyr Arg Arg Trp Ile Ile Leu Leu Ile Ser
1 5 10 15

Met Leu Thr Val Gly Thr Leu Phe Ile Leu Ser Val Trp Asn Ser Ala
20 25 30

Thr Tyr Trp Asp Ile Phe Ile Tyr Gly Val Leu Pro Met Leu Phe Leu
35 40 45

Trp Leu Cys Leu Phe Gly Ile Ala Leu Asn Lys Tyr Glu Gln Ser Val
50 55 60

Ala Ala Cys Ile Ser Trp Glu Ser Glu Arg Gln Gln Val Lys Gln Leu
65 70 75 80

Trp Gln His Trp Ser Gln Lys Gln Leu Ala Ile Val Gly Asn Val Leu
85 90 95

Phe Thr Pro Glu Glu Lys Gly Met Ser Val Leu Leu Gly Pro Gln Glu
100 105 110

Glu Ile Pro Ala Tyr Pro Lys Lys Ala Arg Pro Leu Phe Ser Ala Ser
115 120 125

Arg Tyr Ser Leu Ser Ser Ile Phe His Asp Ile His Gln Gln Leu Thr
130 135 140

Gln Gln Phe Pro Asp Tyr Arg His Tyr Leu His Thr Ile Tyr Val Leu
145 150 155 160

Gln Pro Glu Lys Trp Arg Gly Glu Thr Val Arg Gln Ala Ile Phe His
165 170 175

Gln Trp Asp Leu Val Pro Glu Arg Thr Asn Thr Leu Asn Gln Ile Gln
180 185 190

Ser Leu Tyr Asp Glu Arg Phe Asp Gly Leu Ile Leu Val Val Cys Leu
195 200 205

Gln Asn Trp Pro Glu Asn Lys Pro Glu Asp Thr Ser Glu Leu Val Ser
210 215 220

Ala Gln Leu Ile Ser Ser Ser Ser Phe Val Arg Gln His Gln Ile Pro
225 230 235 240

Val Ile Ala Gly Leu Gly Arg Val Met Pro Leu Glu Pro Glu Glu Leu
245 250 255

Glu His Asn Leu Asp Val Leu Phe Glu Tyr Asn Gln Leu Asp Asn Lys
260 265 270

Gln Leu Gln His Val Trp Val Ser Gly Leu Asp Glu Gly Thr Ile Glu
275 280 285

Asn Leu Met Gln Tyr Ala Glu Gln His Gln Trp Ser Leu Pro Lys Lys
290 295 300

Arg Pro Leu His Met Ile Asp His Ser Phe Gly Pro Thr Gly Glu Phe
305 310 315 320

Ile Phe Pro Val Ser Leu Ala Met Leu Ser Glu Ala Ala Lys Glu Thr
325 330 335

Glu Gln Asn His Leu Ile Ile Tyr Gln Ser Ala Gln Tyr Ala Gln Lys
340 345 350

Lys Ser Leu Cys Leu Ile Thr Arg Lys Leu Tyr Leu Arg Thr
355 360 365

<210> 60

<211> 260

<212> PRT

<213> Escherichia coli

<400> 60

Met Leu Asn Arg Lys Leu Asn Ile Arg Leu Arg His Ser Leu Asn Ser
1 5 10 15

His Cys Ile Pro Ser Ile Ile Ile Asn Asn Thr Val Arg Ser Phe Gln
20 25 30

Arg Ser Val Met Asn Thr Arg Ala Leu Phe Pro Leu Leu Phe Thr Val
35 40 45

Ala Ser Phe Ser Ala Ser Ala Gly Asn Trp Ala Val Lys Asn Gly Trp
50 55 60

Cys Gln Thr Met Thr Glu Asp Gly Gln Ala Leu Val Met Leu Lys Asn
65 70 75 80

Gly Thr Ile Gly Ile Thr Gly Leu Met Gln Gly Cys Pro Asn Gly Val
85 90 95

Gln Thr Leu Leu Gly Ser Arg Ile Ser Ile Asn Gly Asn Leu Ile Pro
100 105 110

Thr Ser Gln Met Cys Asn Gln Gln Thr Gly Phe Arg Ala Val Glu Val
115 120 125

Glu Ile Gly Gln Ala Pro Glu Met Val Lys Lys Ala Val His Ser Ile
130 135 140

Ala Glu Arg Asp Val Ser Val Leu Gln Ala Phe Gly Val Arg Met Glu
145 150 155 160

Phe Thr Arg Gly Asp Met Leu Lys Val Cys Pro Lys Phe Val Thr Ser
165 170 175

Leu Ala Gly Phe Ser Pro Lys Gln Thr Thr Thr Ile Asn Lys Asp Ser
180 185 190

Val Leu Gln Ala Ala Arg Gln Ala Tyr Ala Arg Glu Tyr Asp Glu Glu
195 200 205

Thr Thr Glu Thr Ala Asp Phe Gly Ser Tyr Glu Val Lys Gly Asn Lys
210 215 220

Val Glu Phe Glu Val Phe Asn Pro Glu Asp Arg Ala Tyr Asp Lys Val
225 230 235 240

Thr Val Thr Val Gly Ala Asp Gly Asn Ala Thr Gly Ala Ser Val Glu
245 250 255

Phe Ile Gly Lys
260

<210> 61
<211> 385
<212> PRT
<213> Escherichia coli

<400> 61
Val Val Ile Ile Asn Ser Thr Ile Leu Ser Gly Ala Gly Ala Ile Pro
1 5 10 15

Ser Leu Thr Ser Leu Leu Pro Asp Ile Arg Lys Met Leu Leu Val Thr
20 25 30

Asp Arg Asn Ile Ala Gln Leu Asp Gly Val Gln Gln Ile Arg Ala Leu
35 40 45

Leu Glu Lys His Cys Pro Gln Val Asn Val Ile Asp Asn Val Pro Ala
50 55 60

Glu Pro Thr His His Asp Val Arg Gln Leu Met Asp Ala Pro Gly Asp
65 70 75 80

Ala Ser Phe Asp Val Val Val Gly Ile Gly Gly Gly Ser Val Leu Asp
85 90 95

Val Ala Lys Leu Leu Ser Val Leu Cys His Pro Gln Ser Pro Gly Leu
100 105 110

Asp Ala Leu Leu Ala Gly Glu Lys Pro Thr Gln Arg Val Gln Ser Trp
115 120 125

Leu Ile Pro Thr Thr Ala Gly Thr Gly Ser Glu Ala Thr Pro Asn Ala
130 135 140

Ile Leu Ala Ile Pro Glu Gln Ser Thr Lys Val Gly Ile Ile Ser Gln
145 150 155 160

Val Leu Leu Pro Asp Tyr Val Ala Leu Phe Pro Glu Leu Thr Thr Ser
165 170 175

Met Pro Ala His Ile Ala Ala Ser Thr Gly Ile Asp Ala Leu Cys His
180 185 190

Leu Leu Glu Cys Phe Thr Ala Thr Val Ala Asn Pro Val Ser Asp Asn
195 200 205

Ala Ala Leu Thr Gly Leu Ser Lys Leu Phe Arg His Ile Gln Pro Ala
210 215 220

Val Asn Asp Pro Gln Asp Leu Arg Ala Lys Leu Glu Met Leu Trp Ala
225 230 235 240

Ser Tyr Tyr Gly Gly Val Ala Ile Thr His Ala Gly Thr His Leu Val
245 250 255

His Ala Leu Ser Tyr Pro Leu Gly Gly Lys Tyr His Leu Pro His Gly
260 265 270

Val Ala Asn Ala Ile Leu Leu Ala Pro Cys Met Ala Phe Val Arg Pro
275 280 285

Trp Ala Val Glu Lys Phe Ala Arg Val Trp Asp Cys Ile Pro Asp Ala
290 295 300

Glu Thr Ala Leu Ser Ala Glu Glu Lys Ser His Ala Leu Val Thr Trp
305 310 315 320

Leu Gln Ala Leu Val Asn Gln Leu Lys Leu Pro Asn Asn Leu Ala Ala
325 330 335

Leu Gly Val Pro Pro Glu Asp Ile Ala Ser Leu Ser Glu Ala Ala Leu
340 345 350

Asn Val Lys Arg Leu Met Asn Asn Val Pro Cys Gln Ile Asp Leu Gln
355 360 365

Asp Val Gln Ala Ile Tyr Gln Thr Leu Phe Pro Gln His Pro Phe Lys
370 375 380

Glu
385

<210> 62
<211> 105
<212> PRT
<213> Escherichia coli

<400> 62
Met Asn Ile Arg Lys Leu Phe Cys Pro Gly Asn Thr Pro Arg Ile Leu
1 5 10 15

Leu Phe Leu Phe Phe Phe Val Val Ser Ala Ile Thr Thr Ile Ala Cys
20 25 30

Gly Tyr Thr Glu Lys Asn Ala Thr Gly Asn Val Leu Leu Leu Phe Leu
35 40 45

Leu Leu Leu Leu Ala His Arg Asn Thr Leu Thr Ser Ile Thr Ala Leu
50 55 60

Leu Phe Leu Phe Cys Cys Ala Leu Tyr Ala Pro Ala Gly Met Thr Tyr
65 70 75 80

Gly Lys Ile Asn Asn Ser Phe Ile Val Ala Leu Leu Gln Thr Thr Thr
85 90 95

Asp Glu Ala Ala Glu Phe Thr Gly Met
100 105

<210> 63
<211> 147
<212> PRT
<213> Escherichia coli

<400> 63
Met Asn Ile Gln Ala Ile Lys Glu Met Val Asn Leu Ile Cys Ser Phe
1 5 10 15

Leu Phe Ile Phe Phe Leu Ser Ser Ala Phe Val Ser Phe Gly Cys Tyr
20 25 30

Ala Ile Tyr Glu Leu Phe Leu Trp Asn Asp Ile Ile Val Tyr Ser Trp
35 40 45

Gly Tyr Ile Leu Ile Val Phe Leu Pro Phe Thr Leu Tyr Val Met Ser
50 55 60

Phe Glu Ile Leu Phe Phe Ala Ile Ser Gly Arg Arg Leu Ser Lys Val
65 70 75 80

Thr Met Val Arg Leu Trp Leu Ile Ile Lys Ile Ile Ile Ala Phe Ser
85 90 95

Ile Cys Ala Val Leu Ile Phe Ser Ser Ile Tyr Lys Lys Glu Leu Leu
100 105 110

Ser Arg Asn Tyr Ile Ala Cys Ser Gly Ile Pro Ser Gly Trp Met Pro
115 120 125

Gly Leu Ala Thr Lys Tyr Val Lys Glu Lys Ser Leu Cys Glu Lys Asn
130 135 140

Gly Asn Asn
145

<210> 64
<211> 178
<212> PRT
<213> Escherichia coli

<400> 64
Met Phe Pro Ile Arg Phe Lys Arg Pro Ala Leu Leu Cys Met Ala Met
1 5 10 15

Leu Thr Val Val Leu Ser Gly Cys Gly Leu Ile Gln Lys Val Val Asp
20 25 30

Glu Ser Lys Ser Val Ala Ser Ala Val Phe Tyr Lys Gln Ile Lys Ile
35 40 45

Leu His Leu Asp Phe Phe Ser Arg Ser Ala Leu Asn Thr Asp Ala Glu
50 55 60

Asp Thr Pro Leu Ser Thr Met Val His Val Trp Gln Leu Lys Thr Arg
65 70 75 80

Glu Asp Phe Asp Lys Ala Asp Tyr Asp Thr Leu Phe Met Gln Glu Glu
85 90 95

Lys Thr Leu Glu Lys Asp Val Leu Ala Lys His Thr Val Trp Val Lys
100 105 110

Pro Glu Gly Thr Ala Ser Leu Asn Val Pro Leu Asp Lys Glu Thr Gln
115 120 125

Phe Val Ala Ile Ile Gly Gln Phe Tyr His Pro Asp Glu Lys Ser Asp
130 135 140

Ser Trp Arg Leu Val Ile Lys Arg Asp Glu Leu Glu Ala Asp Lys Pro
145 150 155 160

Arg Ser Ile Glu Leu Met Arg Ser Asp Leu Arg Leu Leu Pro Leu Lys
165 170 175

Asp Lys

<210> 65

<211> 209

<212> PRT

<213> Escherichia coli

<400> 65

Met Phe Leu Lys Arg Lys Trp Tyr Tyr Ala Val Thr Thr Ser Val Val
1 5 10 15

Ile Thr Leu Cys Gly Gly Gly Tyr Tyr Met Tyr Arg Gln Glu Tyr Gln
20 25 30

Met Val Val Thr Val Pro Thr Ala Asp Ala Asn Asp Pro Asn Trp Pro
35 40 45

Asn Lys Arg Ile Gln Phe Asp Thr Ser Glu Trp Leu Gln Gln Leu Gln
50 55 60

Tyr Ile Lys Ile Asp Asp His Tyr Ile Leu Asn Thr Gln Tyr Thr Pro
65 70 75 80

Ile Ala Asn Leu Asp Asp Phe Gly Ile Thr Leu Lys Leu Gln Asn Ala
85 90 95

Leu Asn Gly Ser Asp Lys Arg Leu Pro Ala Leu Tyr Gly Leu Ala Glu
100 105 110

Met Asp Ala Gln Lys Phe Lys Asp Leu Met Arg Gly Lys Ile Lys Cys
115 120 125

Glu Tyr Leu Arg Thr Thr Phe Asp Ala Glu Thr Leu Lys Pro Val Asn
130 135 140

Asp Tyr Phe Leu Ile Ser Phe Thr Tyr Lys Asp Lys Trp Tyr Glu Phe
145 150 155 160

Glu Thr Glu Arg Lys Ile Ser Lys Thr Ser Asp Asp Gly Tyr Phe Leu
165 170 175

Trp Ala Phe Asp Asn Thr Val His Glu Ala Gly Tyr Trp His Asn Thr
180 185 190

Asp Pro Ala Ala Tyr Ser Tyr Arg Asp Tyr Gln Asn Gly Lys Ala Val
195 200 205

Lys

<210> 66

<211> 424

<212> PRT

<213> Escherichia coli

<400> 66

Met Asp Ile Trp Arg Gly His Ser Phe Leu Met Thr Ile Ser Ala Arg
1 5 10 15

Phe Arg Gln Tyr Val Phe Ser Leu Met Ser Ile Leu Leu Gln Glu Arg
20 25 30

Lys Met Asn Ile Phe Thr Leu Ser Lys Ala Pro Leu Tyr Leu Leu Ile
35 40 45

Ser Leu Phe Leu Pro Thr Met Ala Met Ala Ile Asp Pro Pro Glu Arg
50 55 60

Glu Leu Ser Arg Phe Ala Leu Lys Thr Asn Tyr Leu Gln Ser Pro Asp
65 70 75 80

Glu Gly Val Tyr Glu Leu Ala Phe Asp Asn Ala Ser Lys Lys Val Phe
85 90 95

Ala Ala Val Thr Asp Arg Val Asn Arg Glu Ala Asn Lys Gly Tyr Leu
100 105 110

Tyr Ser Phe Asn Ser Asp Ser Leu Lys Val Glu Asn Lys Tyr Thr Met
115 120 125

Pro Tyr Arg Ala Phe Ser Leu Ala Ile Asn Gln Asp Lys His Gln Leu
130 135 140

Tyr Ile Gly His Thr Gln Ser Ala Ser Leu Arg Ile Ser Met Phe Asp
145 150 155 160

Thr Pro Thr Gly Lys Leu Val Arg Thr Ser Asp Arg Leu Ser Phe Lys
165 170 175

Ala Ala Asn Ala Ala Asp Ser Arg Phe Glu His Phe Arg His Met Val
180 185 190

Tyr Ser Gln Asp Ser Asp Thr Leu Phe Val Ser Tyr Ser Asn Met Leu
195 200 205

Lys Thr Ala Glu Gly Met Lys Pro Leu His Lys Leu Leu Met Leu Asp
210 215 220

Gly Thr Thr Leu Ala Leu Lys Gly Glu Val Lys Asp Ala Tyr Lys Gly

225		230		235		240									
Thr	Ala	Tyr	Gly	Leu	Thr	Met	Asp	Glu	Lys	Thr	Gln	Lys	Ile	Tyr	Val
			245						250					255	
Gly	Gly	Arg	Asp	Tyr	Ile	Asn	Glu	Ile	Asp	Ala	Lys	Asn	Gln	Thr	Leu
			260					265					270		
Leu	Arg	Thr	Ile	Pro	Leu	Lys	Asp	Pro	Arg	Pro	Gln	Ile	Thr	Ser	Val
		275					280					285			
Gln	Asn	Leu	Ala	Val	Asp	Ser	Ala	Ser	Asp	Arg	Ala	Phe	Val	Val	Val
	290					295					300				
Phe	Asp	His	Asp	Asp	Arg	Ser	Gly	Thr	Lys	Asp	Gly	Leu	Tyr	Ile	Phe
305					310					315					320
Asp	Leu	Arg	Asp	Gly	Lys	Gln	Leu	Gly	Tyr	Val	His	Thr	Gly	Ala	Gly
			325						330					335	
Ala	Asn	Ala	Val	Lys	Tyr	Asn	Pro	Lys	Tyr	Asn	Glu	Leu	Tyr	Val	Thr
			340					345					350		
Asn	Phe	Thr	Ser	Gly	Thr	Ile	Ser	Val	Val	Asp	Ala	Thr	Lys	Tyr	Ser
		355					360					365			
Ile	Thr	Arg	Glu	Phe	Asn	Met	Pro	Val	Tyr	Pro	Asn	Gln	Met	Val	Leu
	370					375					380				
Ser	Asp	Asp	Met	Asp	Thr	Leu	Tyr	Ile	Gly	Ile	Lys	Glu	Gly	Phe	Asn
385				390						395					400
Arg	Asp	Trp	Asp	Pro	Asp	Val	Phe	Val	Glu	Gly	Ala	Lys	Glu	Arg	Ile
				405					410					415	
Leu	Ser	Ile	Asp	Leu	Lys	Lys	Ser								
			420												

<210> 67

<211> 489

<212> DNA

<213> Escherichia coli

<400> 67

atgaaactga aagctattat attggccacc ggtcttatta actgtattgt attttcagca	60
caggcagtgg atacgacgat tactgtgacg ggtaatgttt tgcaaagaac atgtaatgta	120
ccagggaatg tggatgtttc tttgggtaat ctgtatgtat cagactttcc caatgcagga	180
agtggatctc catgggttaa ttttgatctg tctctcaccg gatgccagaa tatgaatact	240
gttcggggcaa catttagtgg tactgcggat gggcagacat actatgcgaa tacagggaat	300
gctggcggtta tcaagattga aattcaggac agggatggaa gtaatgcac atatacacaat	360
ggatatgttca agacgcttaa tgtacaaaat aataatgcaa cctttaatct taaagcccgt	420
gcagtgahta aaggccaggt tactcctgga aatatcagtt ctgttataac cgtcacctat	480
acctatgcg	489

<210> 68
 <211> 2019
 <212> DNA
 <213> *Escherichia coli*

<400> 68	
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aatgcccaga cttcacagca agacgaaagc acgctggtgg ttaccgccag taaacaatct	120
tcccgctcgg catcagccaa caacgtctcg tctactgttg tcagcgcgcc ggaattaagc	180
gacgccggcg tcaccgccag cgacaaactc cccagagtct tgcccgggct caatattgaa	240
aatagcggca acatgctttt ttcgacgac tcgctacgcg gcgtctcttc agcgcaggac	300
ttctataacc ccgccgtcac cctgtatgtc gatggcgctc ctcagctttc caccaacacc	360
atccaggcgc ttaccgatgt gcaaagcgtg gagttgctgc gaggcccaca gggaacgtta	420
tatggcaaaa gcgctcaggg cgggatcatc aacatcgtca cccagcagcc ggacagcacg	480
ccgcgcggct atattgaagg cggcgtcagt agccgcgaca gttatcgaag taagttcaac	540
ctgagcggcc ccattcagga tggcctgctg tacggcagcg tcaccctggt acgccagggt	600
gatgacggcg acatgattaa cccgcgacg ggaagcgatg acttaggcgg caccgcgcc	660
agcatagggga atgtgaaact gcgtctggcg ccggacgac agccctggga aatgggcttt	720
gccgcctcac gcgaatgtac ccgcgccacc caggacgcct atgtgggatg gaatgatatt	780
aagggccgta agctgtcgat cagcgatggt tcaccagacc cgtacatgcg gcgctgcact	840
gacagccaga ccctgagtgg gaaatacacc accgatgact gggttttcaa cctgatcagc	900
gcctggcagc agcagcatta ttgcgcgacc ttcccttcgg gttcgttaat cgtcaatatg	960

tctcagcgct	ggaatcagga	tgtgcaggag	ctgcgcgctg	caaccctggg	cgatgcgcgt	1020
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<210> 69

<211> 738

<212> DNA

<213> *Escherichia coli*

<400> 69

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<210> 70
 <211> 498
 <212> DNA
 <213> Escherichia coli

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<210> 71
 <211> 3885
 <212> DNA
 <213> Escherichia coli

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 <211> 426
 <212> DNA
 <213> *Escherichia coli*

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agtggccagc aggacagtgg tttttggggc gtatcttcga tcccaggtga cattttaatg	360
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<210> 73
 <211> 954
 <212> DNA
 <213> *Escherichia coli*

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<210> 74

<211> 2175

<212> DNA

<213> Escherichia coli

<400> 74

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<210> 75

<211> 3042

<212> DNA

<213> *Escherichia coli*

<400> 75

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<210> 76

<211> 1362

<212> DNA

<213> Escherichia coli

<400> 76

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<210> 77

<211> 759

<212> DNA

<213> *Escherichia coli*

<400> 77

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gactggaaca	gtggatttgt	aaacactcac	cgtgggtgaag	tatggaaagt	gactgcggat	180
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<210> 78
<211> 1476
<212> DNA
<213> Escherichia coli

<400> 78
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gccagaggtg ataaaccaga agcgggtgacc tggggc 1476

<210> 79
<211> 954
<212> DNA
<213> Escherichia coli

<400> 79
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atttttgctg ctccaggtggc aaaactgtcc catcgggcca tcttcttttg atgtgttggt 180
aatgatgatt ttgcccgaact cattatagag cgtctccgtc atgaaggtgt cattaccgat 240
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cagcagcggg atttcgtctt taatatccct aacagcgcct gcggtttgtt tactgccgag 360
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<210> 80
<211> 513
<212> DNA
<213> Escherichia coli

<400> 80
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tctgatgagt caaaaaattt tacagttaat atgccagacg taccagtag ttcggttaagg 180
agtgcagggg atgttactga aaaggtttat ttttcataa cgtaaacccg ctgtggtagt 240

gatgttggca acgcgtatat aaagtttacc ggcaatacag tttctgaaga tgccagttta	300
tataagctgg aagatggctc ggtagagggg cttgcactta cgatttttga taagaacaaa	360
ggcagtatta gtaatgatgt taaaagcatg gttttttcac ttacatcatc agttgataat	420
atattgcatt tttttgcggc ttacaaagca ttaaaaaata atgtccaacc aggggatgca	480
aatgcgtcag tatcgtttat tgtcacctat gat	513

<210> 81
 <211> 603
 <212> DNA
 <213> Escherichia coli

<400> 81	
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gaaataatat tctcctttcc gtccttggtt gtgcgatatt ctcttcagga attacaactt	180
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caa	603

<210> 82
 <211> 702
 <212> DNA
 <213> Escherichia coli

<400> 82	
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agcaccgttg attatcccag gctcactgat atggatgaca acgttgattc aatggggggg	180
aaaatccgct ttactggccg tgtagtgaaa gctacctgta aggtcgcaac cgattcaaaa	240
cagattgaag ttgtcctgcc ggttgtgcct tccaaccttt tcaactggat cgacgtagaa	300

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catgatttca	gcgcggcctt	tactgcaggt	tatgctcaaa	acggtagcac	tgttgcacca	660
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<210> 83

<211> 1008

<212> DNA

<213> Escherichia coli

<400> 83

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caagataatc	ctgatgttgg	tattatgatt	atggatagtc	agcaaaactc	cgtagattta	960
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<210> 84

<211> 2592

<212> DNA

<213> *Escherichia coli*

<400> 84

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<210> 85
 <211> 507
 <212> DNA
 <213> Escherichia coli

<400> 85	
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gaattacaat cccacgatat ctgggagcac tggctacgat ctcgaggact caactcctcc	480
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<210> 86
 <211> 2139
 <212> DNA
 <213> Escherichia coli

<400> 86	
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<210> 87

<211> 1818

<212> DNA

<213> Escherichia coli

<400> 87

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<210> 88

<211> 303

<212> DNA

<213> Escherichia coli

<400> 88

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cca

303

<210> 89

<211> 789

<212> DNA

<213> Escherichia coli

<400> 89

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<210> 90

<211> 1134

<212> DNA

<213> Escherichia coli

<400> 90

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<210> 91

<211> 1962

<212> DNA

<213> Escherichia coli

<400> 91

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<210> 92

<211> 4128

<212> DNA

<213> Escherichia coli

<400> 92

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<210> 93

<211> 1047

<212> DNA

<213> Escherichia coli

<400> 93

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1047

<210> 94

<211> 2520

<212> DNA

<213> Escherichia coli

<400> 94

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<211> 507

<212> DNA

<213> *Escherichia coli*

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<210> 99
 <211> 1887
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<400> 99

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 <213> Escherichia coli

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 <211> 681
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 <213> *Escherichia coli*

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caaaaaagca aaattgaggg gcttgaaaaa caacaagaac tcgacaagcg caagatagaa	180
cactttgaaa aacaacaaac taccatcata aacagtacca aaacgctcgc tgggtgtggtg	240
aaggcagtta aaaacaaaca ggacgaatth gtctttacag aatttaaccc ggcacaaacc	300
caatacttta ttttaaataa cggctctggt ggtttggcag ggaaaatact gtctattgac	360
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tcaaatatgg gtttctacgc aacatggggg ggagaaaaac ccaccgacat caacgcatta	480
gcaaatggc agcaattgct atttagtacc gcaatgaact cctccctgaa attattacca	540
ggtcaatggc aagacattaa tttagcgcta aaagggtgtct cgcccaacaa cctcaaatat	600
ctgaaattag ccatcaacat ggcaaataat cagttcgacc gtcttcaacc tgctgaatct	660
ccacagcgga aaaacaaaaa a	681

<210> 102
 <211> 3327
 <212> DNA

<213> Escherichia coli

<400> 102

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<210> 103
<211> 534
<212> DNA
<213> Escherichia coli

<400> 103
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<210> 104
<211> 840
<212> DNA
<213> Escherichia coli

<400> 104
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gaagggggcg catttggggc agggatcctg cgccaaccgg gagcaacaaa aaaagccgac 180
acgaaagacc tcaatgtgcc accaccggtt tatgggtccg cgaggtgat atttcgcatt 240
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gtaccctcca ccggttttta taaaatcgac ctgtcacggt tttatcccaa aaacaacggt	780
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<210> 105
 <211> 1503
 <212> DNA
 <213> *Escherichia coli*

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gcgaatactc tagacacagt ttacgagctg ggatcgatga gtaaggcggt taccggactt	300
gtggtgcaaa tactgattca ggaaggcaga ctccggcaag gggatgatat cattacctat	360
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gag	1503

<210> 106
 <211> 2046
 <212> DNA
 <213> Escherichia coli

<400> 106	
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gaaattgctg tttatcagga gaaagttatt cgtgagggtta aatcaggtaa aaaagataaa	960
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<210> 107
 <211> 492
 <212> DNA
 <213> Escherichia coli

<400> 107	
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gtgtcaaata atatcctgga tgatattggt ggttataaag aaagaaatat attaattgctg	180
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attatctacc ta	492

<210> 108
 <211> 654
 <212> DNA
 <213> Escherichia coli

<400> 108
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<210> 109
<211> 8198
<212> DNA
<213> Escherichia coli

<400> 109
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 <211> 963
 <212> DNA
 <213> Escherichia coli

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<210> 111
 <211> 1761
 <212> DNA
 <213> Escherichia coli

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<210> 112
 <211> 2220
 <212> DNA
 <213> *Escherichia coli*

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<210> 113
 <211> 408
 <212> DNA
 <213> *Escherichia coli*

<400> 113	
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 <213> *Escherichia coli*

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ggcgggtata tggatggccc tggcggaaac gtaacgccag taaccattaa cggtacagtc	480
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tataacccaa aaacccatga agtcgttggc taccgctact ttggttttaga tgaccgggcc	600
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gtagctgcgg ttaac	675

<210> 115
 <211> 2163
 <212> DNA
 <213> *Escherichia coli*

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gacaccaccg attctgccgc cggtgccggt ttcaaaacga acgatataga tgtcggcccg	180
ctgggaacga aatcctggat cgaaacacca tattccagca ccaactgttac taaagagatg	240
attgaaaatc agcaggcgca aagcgtcagc gagatgctga aatactctcc cagtacgcaa	300
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ttc 2163

<210> 116
<211> 2007
<212> DNA
<213> Escherichia coli

<400> 116
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<210> 117
 <211> 2259
 <212> DNA
 <213> *Escherichia coli*

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ctcagcgttt ctgtcgggaa gacgaccagt gagcaggaag ctctcgagaa aacaggcgcg	180
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atgagcggat ttggctcgtg aaacactatg gtcgatggta ttaccagag tttttacgga	360
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atcaacgccc ttgccggtag tgcaaataatg cgtactattg gcgttgacga tgtaatat	540
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<210> 118

<211> 399

<212> DNA

<213> *Escherichia coli*

<400> 118

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<210> 119
 <211> 858
 <212> DNA
 <213> Escherichia coli

<400> 119 atgtatataa aaaagcactg gatagcttta tccattctat taataccttg cattggaaac	60
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tggaaatttg catttacact acgttatatt cacaacggtg gacaatggaa tgcgggagag	780
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<210> 120
 <211> 516
 <212> DNA
 <213> Escherichia coli

<400> 120 atgagaatcg caccgcgtac cttctttgct atttccgccc tggcgtttat tgtcgccctcc	60
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<210> 121
 <211> 546
 <212> DNA
 <213> Escherichia coli

<400> 121	
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tacgaa	546

<210> 122
 <211> 1077
 <212> DNA
 <213> Escherichia coli

<400> 122	
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gtgattggtc ctgctgatgc ccatacctat ccccggtgga taggagagct ggcgggaaca	180

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<210> 123
 <211> 2532
 <212> DNA
 <213> Escherichia coli

<400> 123	
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atgtctactg	gcaatcccc	tccaatggct	tctgaagttc	tggatgaaca	tggacagttg	2340

gccggatatg tgcgtcaggc cgggaaggta tttaccaggg gactccctga aaaaggtcat	2400
ctcagcgttg tatggggacc agataataaa gacagatggt catttgtata tcatgttgca	2460
cacaataaag atgatatgca atctcagctc gttcctgttc tgtgtataca gcacccta	2520
caggaaaaaa ca	2532

<210> 124
 <211> 831
 <212> DNA
 <213> Escherichia coli

<400> 124	
atggtaaaat gtcatactct gattaaccgt agaaataaat gtctgctgat tgtttttata	60
gtccttattg gatggattat attcagacct aaagcatata cttattcact aaatgataaa	120
gaaaaagaga tgctcataat gttatcacia catcctgaaa ctcggtactt tggattttat	180
tccatagaac ttccggctga ttacaaacca acaggaatgg ttatgttcat acaaggatcg	240
gcgatgatcc ctgtagaaac aaagctacaa tattatcctc cttttctgca atatatgaca	300
cgatatgagg cagaactaaa aaacacctca gcattagatc cactggatac gccttatttg	360
aagcaagttc acccactaag tccacctatg aatggagtca tttttgaacg aatgaaagcg	420
aaatacaccc cagattttgc acgagtattg gatgcatgga aatgggaaaa tggcgttacg	480
ttttcagtaa aaatagaagc taaagatggg agagcaaccc gctatgatgg aattagtaag	540
attgccgaat acagttatgg atataatatt ccagaaaaaa aagtacagtt acttactatt	600
ctttcaggac tacaacctcg tgcagataac caacccccat cagaaaataa attggcgata	660
caatatgcac aggttgacgc ttactactt ggagagtatg aattatctgt agattataaa	720
aatagcaata atattaaaat aagtttgcag acggataata atagttatat tgactcatta	780
ttagatataa gatatccgag taatggaaac agagcatggg ataactctat a	831

<210> 125
 <211> 1098
 <212> DNA
 <213> Escherichia coli

<400> 125	
atgctacctg agcctgttta tcgacgctgg attatattat taatatctat gttaacagtt	60
ggtactctgt ttattttatc ggtctggaat tctgcgacat actgggatat ttttatttat	120
ggcgttctgc caatgctgtt tctttggcta tgtttgtttg gtattgctgt gaacaaatat	180

gaacaatccg ttgcagcctg tataagttgg gagtctgaaa gacaacaagt taaacaactc	240
tggcaacact ggagccaaaa acaactggca atagttggga atgttctttt tacaccggaa	300
gaaaaaggca tgagtgtttt actggggcca caggaagaga tccctgcata tcctaaaaag	360
gcacgaccgt tattctctgc atcccgttat tctctttcgt ctatattcca tgatattcac	420
cagcaactga cacaacaatt tcctgattat cgtcattatc tacatactat ctacgtatta	480
cagcctgaga aatggcgtgg agaaaccgtg agacaggcta ttttccatca atgggactta	540
gtacctgaac ggaccaatac tcttaatcaa atccagtctc tttatgatga aagatttgac	600
ggctctaattc tggttgtttg tttaaaaaac tggccggaga ataaacctga agatacaggt	660
gaactggtat cagcacagct tatctcctca tcgtcatttg tacggcagca ccagataccc	720
gttattgctg gtctggggcg tgtaatgcc aatagaacctg aggagttgga gcataatctg	780
gatgtgttat ttgaatataa ccaattggat aacaaacaac tacagcatgt ctgggtctct	840
ggtttagatg agggaacgat agaaaacctt atgcagtatg ctgaacaaca tcaatgggtca	900
cttcctaaaa aacggcccct acacatgatt gatcattcct ttggccctac aggagagttt	960
atttttcctg tctctctggc aatgctgtca gaggctgcc aagaaactga acaaaatcat	1020
ttaattatct atcagtcagc acagtatgct cagaaaaaga gcctttgcct gattaccg	1080
aagctttatt taaggaca	1098

<210> 126
 <211> 780
 <212> DNA
 <213> Escherichia coli

<400> 126	
atgttgaaca gaaaactaaa tatacggcta cgtcattccc tgaacagtca ctgcatacct	60
tccatcatta tcaataacac cgtacgttca tttcagaggt cagtcatgaa taccagagct	120
ctttttcccc tgctgttcac tgtggcatca ttctccgct cgcgggcaa ctgggctgtc	180
aaaaacggct ggtgtcagac catgacggaa gatggtcagg cgctggtaat gctgaaaaat	240
ggcacgattg gtattaccgg cctgatgcag ggatgccga atgggtgtaca gacgctcctg	300
ggcagccgta tcagtattaa cggtaacctg atccccacat cacaaatgtg taatcagcag	360
acgggattca gggctgttga ggtggaaatc ggacaggcgc cggaatgggt caaaaaagcc	420
gttcaactcca tagcagagcg tgatgtgtcc gttttacagg catttggtgt acgaatggaa	480
ttcaccgcgc gtgatatgct gaaggtctgt ccgaaatttg tcacatcact tgccggtttt	540

tccccgaaac agacgaccac tattaataaa gattccgtcc tgcaggctgc ccggcaggca	600
tacgcccggg aatatgacga ggaacaaca gaaaccgctg attttggctc ttacgaagta	660
aaaggcaata aggttgagtt tgaagtattc aatcctgaag accgtgctga cgacaaagt	720
accgtcacgg ttggtgctga cggtaatgcc accggcgcca gcgttgaatt tatcgaaaaa	780

<210> 127

<211> 1155

<212> DNA

<213> Escherichia coli

<400> 127

gtggtaatta tcaatagcac gatactgagc ggcgaggcg ctatcccttc cctgacgtcg	60
ctcttaccgc acatcagaaa aatgctgctg gtcactgacc gtaatatgtc gcagctcgac	120
ggtgtgcagc agattcgcgc cttactggaa aagcactgcc cgcagggtta cgttatcgat	180
aatgtgcccg cagagcccac gcatcatgat gtgcccagc taatggatgc ccctggcgat	240
gcctcttttg atgtggtggt cgggatcggc ggtggcagcg tgttgatgt ggcgaagctg	300
ctatcggctc tttgccatcc acaatcaccg gggctggatg cgctgcttgc gggtgaaaaa	360
ccgactcagc ggggtgaatc atggttgatt cctacaaccg ccggaaccgg ctcagaagcc	420
acgccgaatg cgattctggc aatccctgag caaagcacga aggtgggtat tatttcccag	480
gtgctgttac cagactatgt ggcgcttttc ccggaactga ccaccagcat gccgcgcat	540
attgcccgtt ccacgggcat tgatgctctt tgccacttac tggagtgttt taccgcgacc	600
gtggcaaatc cggctcagca taacgcggcg ctgactgggt taagtaaact tttccggcac	660
attcaaccgc ccgtgaacga tcctcaggat ctgcgcgcaa aactggaaat gctgtgggcg	720
tcctactatg gcggcgtagc gataacccat gcgggcacgc atctcgttca tgcgctctcc	780
taccggttag gtggcaaata tcatctgccg catggcgctc cgaatgccat cttgctggcg	840
ccgtgcatgg cgtttgttcg cccctgggcg gtcgagaaat ttgccgggt ctgggattgc	900
attcccgatg cggaaaccgc cctgagcgcg gaagaaaaat ctcatgccct ggtgacctgg	960
ttacaggcat tagtcaatca actcaagcta cccaacaatc tcgcggctct cggcgtagcg	1020
ccagaggata ttgcctctct gagcgaggcg gactgaacg tgaagcgctt tatgaacaat	1080
gtgccgtgcc aaattgatct acaggacgta caggccattt accaaacact gtttccgcaa	1140
catccattta aggag	1155

<210> 128

<211> 315
<212> DNA
<213> Escherichia coli

<400> 128
atgaatatca gaaaactggt ttgtccggga aacaccccc ggattttatt gtttttattc 60
ttttttgttg tttctgcaat aaccacaatt gcatgcggat aactgagaa gaatgcaaca 120
ggaaatgtgc tgcttctgtt tctccttctg ctcttgcac acagaaatac cctcacatcc 180
attacagcgc tgttatttct gttctgttgt gcaactgtat gcctgccgg tatgacgtac 240
ggtaaaatca acaacagttt tattgtcgcg ttgttgcaga ccacaactga tgaggcagcg 300
gagtttaccg ggatg 315

<210> 129
<211> 441
<212> DNA
<213> Escherichia coli

<400> 129
atgaatatc aggcaataaa agaaatggta aatttaattt gtagtttttt atttatatc 60
tttctgtcct cggttttgt ttttttggg tgttatgcta tttatgaatt gtttttatgg 120
aatgatatta ttgtatatag ctggggatat atattaattg tctttttacc tttcacatta 180
tatgtaatgt cgtttgagat tttgtttttt gctattagt ggcgacgatt gtctaaagta 240
acaatggtgc gcctttggtt gataattaaa attattattg ctttctctat ttgcgcagtg 300
ttgatttttt cttcaattta caaaaaagaa ttattatcta gaaattatat tgctttagt 360
ggtatcccg ctgggtggat gccgggtctg gcaacgaaat acgttaaaga aaaatcatta 420
tgcgaaaaaa atggcaataa t 441

<210> 130
<211> 534
<212> DNA
<213> Escherichia coli

<400> 130
atgtttccta ttcgttttaa acgtccggcg ttgctctgta tggcgatgct gacggttgtt 60
ctgagtggct gcgggctgat tcagaaagtg gtggatgaat cgaaaagcgt ggcctcagcc 120
gttttctaca aacaaatcaa aatactgcat ctcgatttct tctccgcag cgccctgaat 180
acggatgcgg aagatacgcc gctttccacg atggtgcatg tctggcaact gaaaaccgc 240
gaagattttg acaaggcgga ttacgacacc ctgtttatgc aggaagagaa gacgctggag 300

aaggacgtac tggcaaaaca caccgtctgg gtaaaaccgg aaggcacggc atccctgaat	360
gtgccgctgg ataaagagac gcagtttgtc gccattattg ggcagtttta tcaccctgat	420
gaaaaaagcg acagctggcg tctggtgatc aaaagggacg aactggaggc cgacaagccg	480
cgctcgattg aactgatgag aagcgacctg cgactgctgc ctctcaagga taaa	534

<210> 131
 <211> 627
 <212> DNA
 <213> Escherichia coli

<400> 131	
atgttcttaa aaagaaaatg gtattacgca gtgacgacat ctgtcgtcat tactttgtgt	60
ggtggaggat attatatgta caggcaagaa tatcagatgg ttgtcactgt accaactgct	120
gacgcgaacg atcccaactg gccaaataaa aggatacagt ttgataccag cgaatggcta	180
cagcaacttc aatatattaa aatagatgat cattatatat tgaatactca atatactcca	240
attgctaatt tggatgactt tggattaca ttaaaattac agaacgcatt aaatgggtcg	300
gataaaagac ttcctgcact atatggcctt gctgagatgg atgctcagaa atttaaagac	360
ctgatgcgcg gtaaaattaa atgtgaatat ctgaggacga catttgatgc ggaaacatta	420
aagcctgtca atgattatct ccttatttct ttactttata aagataagt gtatgaattt	480
gagacagaaa gaaaaatatc taaaacaagt gatgatgggt attttttgtg ggcatttgat	540
aatactgtcc acgaagcagg ctattggcat aacacagatc cggctgcgta ttcctataga	600
gattaccaga atggtaaggc tgtgaaa	627

<210> 132
 <211> 1272
 <212> DNA
 <213> Escherichia coli

<400> 132	
atggatatctt ggcggggaca ttcgtttctg atgacaattt ccgctagggt cagacaatac	60
gttttctctc ttatgtcaat ttatttgcag gaacgaaaaa tgaatatctt cactttatcc	120
aaagcaccgc tatacctgtt aatttcacta tttttacca cgatggccat ggctatcgat	180
ccacctgaac gcgaactttc gcgatttgc ctgaaaacga attaccttca gtcccctgat	240
gaaggcgtct atgaactggc gtttgataat gccagtaaaa aggtgtttgc agcagtcacc	300
gatcgtgtaa atcgtgaagc caataaaggc tatctgtatt cgtttaattc agattcgtg	360
aaagtcgaaa ataaatacac gatgccatac cgggcatttt cgctggcgat aaatcaggat	420

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aaacatcagc tctatatcgg acacacccag tcagcgtccc tgcgtatcag tatgtttgac 480
accccaaccg gcaaactggg aagaaccagc gacagggttaa gtttttaaagc ggcaaacgct 540
gcagattcgc gttttgagca ttttcgccat atgggtttaca gccaggattc cgataccctg 600
tttgtgagtt atagcaatat gctgaaaacg gccgagggca tgaagcctct gcataagctg 660
ttaatgctcg acgggacgac gcttgcccta aaaggcgagg ttaaggatgc ttacaaaggt 720
acagcgtatg gtctgacgat ggatgaaaaa acacagaaaa tctacgttgg cggaagagat 780
tacatcaacg aaattgatgc gaaaaatcag acgctgctgc gtaccatccc gttgaaagat 840
ccgagaccac aaatcacaag tgtgcagaat ctggcggtgg actccgcttc tgaccgtgcc 900
tttgtggtgg tattcgacca tgacgatcgt tccggtacaa aagatggact ctatatTTTT 960
gacttacgcg acggtaaaca gcttggttat gtgcacacag gagccggagc taacgcggtg 1020
aaatacaatc cgaaatataa cgaactgtat gtcaccaact tctagcgg caccatcagc 1080
gtagtggatg ccaccaaata cagcatcacc cgtgaattta acatgccggt ctacccaaac 1140
cagatggtgt tgtcggacga tatggatacc ctttacattg gcatcaaaga aggctttaac 1200
cgcgattggg atcctgatgt gtttgtggaa ggagctaaag aacgtattct gagcattgat 1260
ttgaaaaagt cg 1272

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<210> 133
<211> 163
<212> PRT
<213> Escherichia coli

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<400> 133
Met Ala Ile Pro Ala Tyr Leu Trp Leu Lys Asp Asp Gly Gly Ala Asp
1          5          10         15

Ile Lys Gly Ser Val Asp Val Gln Gly Arg Glu Gly Ser Ile Glu Val
          20         25         30

Val Ala Leu Asp His Asp Val Tyr Ile Pro Thr Asp Asn Asn Thr Gly
          35         40         45

Lys Leu Thr Gly Thr Arg Thr His Lys Pro Phe Thr Phe Thr Lys Glu
          50         55         60

Ile Asp Ala Ser Ser Pro Tyr Leu Tyr Lys Ala Val Thr Thr Gly Gln
65          70          75         80

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Thr Leu Lys Thr Ala Glu Phe Lys Phe Tyr Arg Ile Asn Asp Ala Gly
85 90 95

Gln Glu Val Glu Tyr Phe Asn Ile Thr Leu Asp Asn Val Lys Leu Val
100 105 110

Arg Val Ala Pro Leu Met His Asp Ile Lys Asp Pro Ser Arg Glu Lys
115 120 125

His Asn His Leu Glu Arg Ile Glu Phe Arg Tyr Glu Lys Ile Thr Trp
130 135 140

Thr Tyr Lys Asp Gly Asn Ile Ile His Ser Asp Ser Trp Asn Glu Arg
145 150 155 160

Pro Ser Ala

<210> 134

<211> 550

<212> PRT

<213> Escherichia coli

<400> 134

Val Arg Asn Thr Leu Lys Gln Ala Ile Val Leu Trp Gly Met Val Leu
1 5 10 15

Leu Leu Val Leu Trp Ser Val Phe Ile Ser Pro Ser Gly Val Leu Arg
20 25 30

Trp Ala Gly Ala Ala Ala Ile Val Leu Ala Val Ala Ala Leu Leu Ile
35 40 45

Tyr Arg Arg Arg Gln Ala Trp Thr Glu Met Thr Gly Asp Ala Gly Leu
50 55 60

Ser Ser Leu Pro Pro Glu Thr Tyr Arg Gln Pro Val Val Leu Val Cys
65 70 75 80

Gly Gly Leu Ser Ala His Leu Ser Thr Asp Ser Pro Val Arg Gln Val
85 90 95

Ser Glu Gly Leu Tyr Leu His Val Pro Asp Glu Glu Gln Leu Val Ala
100 105 110

Gln Val Glu Arg Leu Leu Thr Leu Arg Pro Ala Trp Ala Ser Gln Leu
115 120 125

Ala Val Ala Tyr Thr Ile Met Pro Gly Ile His Arg Asp Val Ala Val
130 135 140

Leu Ala Gly Arg Leu Arg Arg Phe Ala His Ser Met Ala Thr Val Arg
145 150 155 160

Arg Arg Ala Gly Val Asn Val Pro Trp Leu Leu Trp Ser Gly Leu Ser
165 170 175

Gly Ser Pro Leu Pro Glu Arg Ala Ser Ser Pro Trp Phe Ile Cys Thr
180 185 190

Gly Gly Glu Val Gln Val Ala Thr Ser Thr Glu Thr Thr Met Pro Ala
195 200 205

Gln Trp Ile Ala Gln Ser Gly Val Gln Glu Arg Ser Gln Arg Leu Cys
210 215 220

Tyr Leu Leu Lys Ala Glu Ser Leu Met Gln Trp Leu Asn Leu Asn Val
225 230 235 240

Leu Thr Ala Leu Asn Gly Pro Glu Ala Lys Cys Pro Pro Leu Ala Met
245 250 255

Thr Val Gly Leu Val Pro Ser Leu Pro Ala Val Asp Asn Asn Leu Trp
260 265 270

Gln Leu Trp Ile Thr Ala Arg Thr Gly Leu Thr Pro Asp Ile Ala Asp
275 280 285

Thr Gly Thr Asp Asp Ala Leu Pro Phe Pro Asp Ala Leu Leu Arg Gln
290 295 300

Leu Pro Arg Gln Ser Gly Phe Thr Pro Leu Arg Arg Ala Cys Val Thr
305 310 315 320

Met Leu Gly Val Thr Thr Val Ala Gly Ile Ala Ala Leu Cys Leu Ser
325 330 335

Ala Thr Ala Asn Arg Gln Leu Leu Arg Gln Val Gly Asp Asp Leu His
340 345 350

Arg Phe Tyr Ala Val Pro Val Glu Glu Phe Ile Thr Lys Ala Arg His
355 360 365

Leu Ser Val Leu Lys Asp Asp Ala Thr Met Leu Asp Gly Tyr Tyr Arg
370 375 380

Glu Gly Glu Pro Leu Arg Leu Gly Leu Gly Leu Tyr Pro Gly Glu Arg
385 390 395 400

Ile Arg Gln Pro Val Leu Arg Ala Ile Arg Asp Trp Arg Pro Pro Glu
405 410 415

Gln Lys Met Glu Val Thr Ala Ser Leu Gln Val Gln Thr Val Arg Leu
420 425 430

Asp Ser Met Ser Leu Phe Asp Val Gly Gln Ala Arg Leu Lys Asp Gly
435 440 445

Ser Thr Lys Val Leu Val Asp Ala Leu Val Asn Ile Arg Ala Lys Pro
450 455 460

Gly Trp Leu Ile Leu Val Ala Gly Tyr Thr Asp Ala Thr Gly Asp Glu
465 470 475 480

Lys Ser Asn Gln Gln Leu Ser Leu Arg Arg Ala Glu Ala Val Arg Asn
485 490 495

Trp Met Leu Gln Thr Ser Asp Ile Pro Ala Thr Cys Phe Ala Val Gln
500 505 510

Gly Leu Gly Glu Ser Gln Pro Ala Ala Thr Asn Asp Thr Pro Gln Gly
515 520 525

Arg Ala Val Asn Arg Arg Val Glu Ile Ser Leu Val Pro Arg Ser Asp
530 535 540

Ala Cys Gln Asp Val Lys
545 550

<210> 135
<211> 194
<212> PRT
<213> Escherichia coli

<400> 135
Met Ile Lys Ser Thr Phe Trp Arg Ala Leu Ala Leu Thr Ala Thr Leu
1 5 10 15

Ile Leu Thr Gly Cys Ser His Ser Gln Pro Glu Gln Glu Gly Arg Pro
20 25 30

Gln Ala Trp Leu Gln Pro Gly Thr Leu Ile Thr Leu Pro Ala Pro Gly
35 40 45

Ile Ser Pro Ala Val Asn Ser Gln Gln Leu Leu Thr Gly Ser Phe Asn
50 55 60

Gly Lys Thr Gln Ser Leu Leu Val Met Leu Asn Ala Glu Asp Gln Lys
65 70 75 80

Ile Thr Leu Ala Gly Leu Ser Ser Val Gly Ile Arg Leu Phe Leu Val
85 90 95

Thr Tyr Asp Ala Lys Gly Leu Arg Ala Glu Gln Ser Ile Val Val Pro
100 105 110

Gln Leu Pro Pro Ala Ser Gln Val Leu Ala Asp Val Met Leu Ser His
115 120 125

Trp Pro Ile Ser Ala Trp Gln Pro Gln Leu Pro Thr Gly Trp Thr Leu
130 135 140

Arg Asp Asn Gly Asp Lys Arg Glu Leu Arg Asn Ala Ser Gly Lys Leu
145 150 155 160

Val Thr Glu Ile Thr Tyr Leu Asn Arg Gln Gly Lys Arg Val Pro Ile
165 170 175

Ser Ile Glu Gln His Val Phe Lys Tyr His Ile Thr Ile Gln Tyr Leu
180 185 190

Gly Asp

<210> 136
<211> 129
<212> PRT
<213> Escherichia coli

<400> 136
Met Lys Arg Tyr Ile Lys Trp Phe Ala Ile Thr Ile Phe Ile Ser Met
1 5 10 15

Leu Ser Ala Cys Val Arg Thr Ala Pro Val Gln Gln Ile Ser Thr Thr
20 25 30

Val Ser Val Gly His Thr Gln Glu Gln Val Lys Asn Ala Ile Leu Lys
35 40 45

Ala Gly Ala Gln Arg Lys Trp Ile Met Thr Gln Val Ser Pro Gly Val
50 55 60

Ile Lys Ala Arg Tyr Gln Thr Arg Asn His Val Ala Glu Val Arg Ile
65 70 75 80

Thr Tyr Thr Ala Thr Tyr Tyr Asn Ile Lys Tyr Asp Ser Ser Leu Asn
85 90 95

Leu Gln Ala Ser Asp Gly Lys Ile His Lys Asn Tyr Asn Arg Trp Val
100 105 110

Arg Asn Leu Asp Lys Asp Ile Gln Val Asn Leu Ser Thr Gly Ala Thr
115 120 125

Leu

<210> 137
<211> 415
<212> PRT
<213> Escherichia coli

<400> 137
Met Lys Arg Lys His Leu Leu Leu Leu Leu Leu Phe Ser Phe Ser Thr
1 5 10 15

Asn Ser Ala Pro Leu Tyr Ser Leu Ile Arg Glu Ala Val Met His Asp
20 25 30

Pro Ile Val Met Glu Ala Arg Ala Glu Leu Thr Ser Ala Gln Ser Arg
35 40 45

Ile Glu Gln Ala Ser Ser Ala His Trp Pro Val Val Thr Ala Thr Gly
50 55 60

Ser Lys Leu Leu Ser Gln Ser His Arg Tyr Ser Tyr Asp Tyr Asp Thr
65 70 75 80

Glu Asp Ile Leu Pro Gly Ile Arg Gly Glu Val Asn Ile Phe Ala Ser
85 90 95

Gly Ala Ile Glu Ala Asp Val Arg Arg Ser Glu Ser Glu Ala Glu Tyr
100 105 110

Tyr His Tyr Lys Met Glu Glu Thr Lys Glu Glu Thr Ile His Ser Phe
115 120 125

Val Ser Leu Tyr Leu Asp Ala Leu Arg Glu Lys Gln Ser Ile Ala Val
130 135 140

Leu Glu Gln Ser Leu Ser Arg His Asn Ala Ile Leu Asn Asp Leu Asn
145 150 155 160

Thr Ile Ser Ile His Asp Thr Gly Arg Glu Ser Glu Leu Val Gln Ala
165 170 175

Glu Ala Arg Arg Leu Met Val Arg Gln Gln Ile Asn Ser Arg Ser Arg
180 185 190

Val Leu Lys Thr Thr Leu Gly Lys Leu Ser Thr Trp Thr Lys Asn Pro
195 200 205

Val Thr Glu Ala Asp Leu Glu Asn Pro Phe Ser Arg Met Thr Glu Ala
210 215 220

Lys Leu Leu Thr Asp Phe Thr Gln Ala Pro Gln Lys Gly Asn Pro Ser
225 230 235 240

Trp Leu Ala Ser Gln Ala Asp Val Glu Ser Lys Lys Ala Ala Leu Lys
245 250 255

Ala Gln Glu Leu Ala Arg Tyr Pro Arg Val Asp Leu Thr Gly Ser Val
260 265 270

Thr Arg Asp Asp Gln Gln Ile Gly Val Asn Leu Ser Trp Asp Leu Phe
275 280 285

Asn Arg Asn Ala Ser Tyr Gly Val Thr Glu Lys Ala Ala Gln Ile Val
290 295 300

Ala Ala Thr Gly Arg Leu Asp Ser Val Ala Arg Met Ile Asp Glu Thr
305 310 315 320

Gly Arg Leu Ser Leu Ile Thr Val Arg Gln Ser Arg Gly Glu Met Glu
325 330 335

Thr Leu Arg Arg Gln Glu Gln Ala Ser Ala Arg Val Val Asp Phe Tyr
340 345 350

Arg Leu Gln Phe Gln Val Ala Arg Lys Thr Leu Ile Glu Leu Leu Asn
355 360 365

Ala Glu Asn Glu Leu Tyr Ser Val Gly Leu Ser Arg Val Gln Thr Glu
370 375 380

Asp Gln Met Leu His Gly Met Leu Asp Tyr Leu Tyr Ser Gln Gly Met
385 390 395 400

Leu Leu Lys Trp Ser Gly Val Asn Leu Ser Gly Glu Glu Glu Lys
405 410 415

<210> 138

<211> 201

<212> PRT

<213> Escherichia coli

<400> 138

Met Lys Phe Leu Pro Leu Leu Ala Leu Leu Ile Ser Pro Phe Val Ser
1 5 10 15

Ala Leu Thr Leu Asp Asp Leu Gln Gln Arg Phe Thr Glu Gln Pro Val
20 25 30

Ile Arg Ala His Phe Asp Gln Thr Arg Thr Ile Lys Asp Leu Pro Gln

35	40	45
Pro Leu Arg Ser Gln Gly Gln Met Leu Ile Ala Arg Asp Gln Gly Leu		
50	55	60
Leu Trp Asp Gln Thr Ser Pro Phe Pro Met Gln Leu Leu Leu Asp Asp		
65	70	75 80
Lys Arg Met Val Gln Val Ile Asn Gly Gln Pro Pro Gln Ile Ile Thr		
85	90	95
Ala Glu Asn Asn Pro Gln Met Phe Gln Phe Asn His Leu Leu Arg Ala		
100	105	110
Leu Phe Gln Ala Asp Arg Lys Val Leu Glu Gln Asn Phe Arg Val Glu		
115	120	125
Phe Ala Asp Lys Gly Glu Gly Arg Trp Thr Leu Arg Leu Thr Pro Thr		
130	135	140
Thr Thr Pro Leu Asp Lys Ile Phe Asn Thr Ile Asp Leu Ala Gly Lys		
145	150	155 160
Thr Tyr Leu Glu Ser Ile Gln Leu Asn Asp Lys Gln Gly Asp Arg Thr		
165	170	175
Asp Ile Ala Leu Thr Gln His Gln Leu Thr Pro Ala Gln Leu Thr Asp		
180	185	190
Asp Glu His Gln Arg Phe Ala Ala Gln		
195	200	

<210> 139
 <211> 770
 <212> PRT
 <213> Escherichia coli

<400> 139
Met Glu Asn Phe Phe Met Lys Asn Ser Lys Val Phe Tyr Arg Ser Ala
1 5 10 15
Leu Ala Thr Ala Ile Val Met Ala Leu Ser Ala Pro Ala Phe Ala Thr
20 25 30

Asp	Ser	Thr	Val	Ser	Thr	Asp	Pro	Val	Thr	Leu	Asn	Thr	Glu	Lys	Thr	
		35					40					45				
Thr	Leu	Asp	Gln	Asp	Val	Val	Ile	Asn	Gly	Asp	Asn	Lys	Ile	Thr	Ala	
	50					55					60					
Val	Thr	Ile	Glu	Thr	Ser	Asp	Ser	Asp	Lys	Asp	Leu	Asn	Val	Thr	Phe	
65					70					75					80	
Gly	Gly	His	Asp	Ile	Thr	Ala	Ala	Ser	Thr	Val	Asn	Gln	Asp	Phe	Val	
				85					90					95		
Glu	Gly	Val	Lys	Val	Ser	Gly	Asn	Lys	Asn	Val	Val	Ile	Asn	Ala	Thr	
			100					105					110			
Asp	Ser	Thr	Ile	Thr	Ala	Gln	Gly	Glu	Gly	Thr	Tyr	Val	Arg	Thr	Ala	
		115					120					125				
Met	Val	Ile	Asp	Ser	Thr	Gly	Asp	Val	Val	Val	Asn	Gly	Gly	Asn	Phe	
	130					135					140					
Val	Ala	Lys	Asn	Glu	Lys	Gly	Ser	Ala	Thr	Gly	Ile	Ser	Leu	Glu	Ala	
145					150					155					160	
Thr	Thr	Gly	Asn	Asn	Leu	Thr	Leu	Asn	Gly	Thr	Thr	Ile	Asn	Ala	Gln	
				165					170					175		
Gly	Asn	Lys	Ser	Tyr	Ser	Asn	Gly	Ser	Thr	Ala	Ile	Phe	Ala	Gln	Lys	
			180					185					190			
Gly	Asn	Leu	Leu	Gln	Gly	Phe	Asp	Gly	Asp	Ala	Thr	Asp	Asn	Ile	Thr	
		195					200					205				
Leu	Ala	Asp	Ser	Asn	Ile	Ile	Asn	Gly	Gly	Ile	Glu	Thr	Ile	Val	Thr	
	210					215					220					
Ala	Gly	Asn	Lys	Thr	Gly	Ile	His	Thr	Val	Asn	Leu	Asn	Ile	Lys	Asp	
225					230					235					240	
Gly	Ser	Val	Ile	Gly	Ala	Ala	Asn	Asn	Lys	Gln	Thr	Ile	Tyr	Ala	Ser	
				245					250					255		
Ala	Ser	Ala	Gln	Gly	Ala	Gly	Ser	Ala	Thr	Gln	Asn	Leu	Asn	Leu	Ser	

260	265	270
Val Ala Asp Ser Thr Ile Tyr Ser Asp Val Leu Ala Leu Ser Glu Ser		
275	280	285
Glu Asn Ser Ala Ser Thr Thr Thr Asn Val Asn Met Asn Val Ala Arg		
290	295	300
Ser Tyr Trp Glu Gly Asn Ala Tyr Thr Phe Asn Ser Gly Asp Lys Ala		
305	310	315
Gly Ser Asp Leu Asp Ile Asn Leu Ser Asp Ser Ser Val Trp Lys Gly		
325	330	335
Lys Val Ser Gly Ala Gly Asp Ala Ser Val Ser Leu Gln Asn Gly Ser		
340	345	350
Val Trp Asn Val Thr Gly Ser Ser Thr Val Asp Ala Leu Ala Val Lys		
355	360	365
Asp Ser Thr Val Asn Ile Thr Lys Ala Thr Val Asn Thr Gly Thr Phe		
370	375	380
Ala Ser Gln Asn Gly Thr Leu Ile Val Asp Ala Ser Ser Glu Asn Thr		
385	390	395
Leu Asp Ile Ser Gly Lys Ala Ser Gly Asp Leu Arg Val Tyr Ser Ala		
405	410	415
Gly Ser Leu Asp Leu Ile Asn Glu Gln Thr Ala Phe Ile Ser Thr Gly		
420	425	430
Lys Asp Ser Thr Leu Lys Ala Thr Gly Thr Thr Glu Gly Gly Leu Tyr		
435	440	445
Gln Tyr Asp Leu Thr Gln Gly Ala Asp Gly Asn Phe Tyr Phe Val Lys		
450	455	460
Asn Thr His Lys Ala Ser Asn Ala Ser Ser Val Ile Gln Ala Met Ala		
465	470	475
Ala Ala Pro Ala Asn Val Ala Asn Leu Gln Ala Asp Thr Leu Ser Ala		

485					490					495					
Arg	Gln	Asp	Ala 500	Val	Arg	Leu	Ser	Glu 505	Asn	Asp	Lys	Gly	Gly 510	Val	Trp
Ile	Gln	Tyr 515	Phe	Gly	Gly	Lys	Gln 520	Lys	His	Thr	Thr	Ala 525	Gly	Asn	Ala
Ser	Tyr 530	Asp	Leu	Asp	Val	Asn 535	Gly	Val	Met	Leu	Gly 540	Gly	Asp	Thr	Arg
Phe 545	Met	Thr	Glu	Asp	Gly 550	Ser	Trp	Leu	Ala	Gly 555	Val	Ala	Met	Ser	Ser 560
Ala	Lys	Gly	Asp	Met 565	Thr	Thr	Met	Gln	Ser 570	Lys	Gly	Asp	Thr	Glu 575	Gly
Tyr	Ser	Phe	His 580	Ala	Tyr	Leu	Ser	Arg 585	Gln	Tyr	Asn	Asn	Gly 590	Ile	Phe
Ile	Asp	Thr 595	Ala	Ala	Gln	Phe	Gly 600	His	Tyr	Ser	Asn	Thr 605	Ala	Asp	Val
Arg	Leu 610	Met	Asn	Gly	Gly	Gly 615	Thr	Ile	Lys	Ala	Asp 620	Phe	Asn	Thr	Asn
Gly 625	Phe	Gly	Ala	Met	Val 630	Lys	Gly	Gly	Tyr	Thr 635	Trp	Lys	Asp	Gly	Asn 640
Gly	Leu	Phe	Ile	Gln 645	Pro	Tyr	Ala	Lys	Leu 650	Ser	Ala	Leu	Thr	Leu 655	Glu
Gly	Val	Asp	Tyr 660	Gln	Leu	Asn	Gly	Val 665	Asp	Val	His	Ser	Asp 670	Ser	Tyr
Asn	Ser	Val 675	Leu	Gly	Glu	Ala	Gly 680	Thr	Arg	Val	Gly	Tyr 685	Asp	Phe	Ala
Val	Gly 690	Asn	Ala	Thr	Val	Lys 695	Pro	Tyr	Leu	Asn	Leu 700	Ala	Ala	Leu	Asn
Glu 705	Phe	Ser	Asp	Gly	Asn 710	Lys	Val	Arg	Leu	Gly 715	Asp	Glu	Ser	Val	Asn 720

Ala Ser Ile Asp Gly Ala Ala Phe Arg Val Gly Ala Gly Val Gln Ala
725 730 735

Asp Ile Thr Lys Asn Met Gly Ala Tyr Ala Ser Leu Asp Tyr Thr Lys
740 745 750

Gly Asp Asp Ile Glu Asn Pro Leu Gln Gly Val Val Gly Ile Asn Val
755 760 765

Thr Trp
770

<210> 140
<211> 660
<212> PRT
<213> Escherichia coli

<400> 140
Met Ser Arg Pro Gln Phe Thr Ser Leu Arg Leu Ser Leu Leu Ala Leu
1 5 10 15

Ala Val Ser Ala Thr Leu Pro Thr Phe Ala Phe Ala Thr Glu Thr Met
20 25 30

Thr Val Thr Ala Thr Gly Asn Ala Arg Ser Ser Phe Glu Ala Pro Met
35 40 45

Met Val Ser Val Ile Asp Thr Ser Ala Pro Glu Asn Gln Thr Ala Thr
50 55 60

Ser Ala Thr Asp Leu Leu Arg His Val Pro Gly Ile Thr Leu Asp Gly
65 70 75 80

Thr Gly Arg Thr Asn Gly Gln Asp Val Asn Met Arg Gly Tyr Asp His
85 90 95

Arg Gly Val Leu Val Leu Val Asp Gly Val Arg Gln Gly Thr Asp Thr
100 105 110

Gly His Leu Asn Gly Thr Phe Leu Asp Pro Ala Leu Ile Lys Arg Val
115 120 125

Glu Ile Val Arg Gly Pro Ser Ala Leu Leu Tyr Gly Ser Gly Ala Leu

130						135						140				
Gly	Gly	Val	Ile	Ser	Tyr	Asp	Thr	Val	Asp	Ala	Lys	Asp	Leu	Leu	Gln	
145					150					155					160	
Glu	Gly	Gln	Ser	Ser	Gly	Phe	Arg	Val	Phe	Gly	Thr	Gly	Gly	Thr	Gly	
				165					170					175		
Asp	His	Ser	Leu	Gly	Leu	Gly	Ala	Ser	Ala	Phe	Gly	Arg	Thr	Glu	Asn	
			180					185					190			
Leu	Asp	Gly	Ile	Val	Ala	Trp	Ser	Ser	Arg	Asp	Arg	Gly	Asp	Leu	Arg	
		195					200					205				
Gln	Ser	Asn	Gly	Glu	Thr	Ala	Pro	Asn	Asp	Glu	Ser	Ile	Asn	Asn	Met	
	210					215					220					
Leu	Ala	Lys	Gly	Thr	Trp	Gln	Ile	Asp	Ser	Ala	Gln	Ser	Leu	Ser	Gly	
225					230					235					240	
Leu	Val	Arg	Tyr	Tyr	Asn	Asn	Asp	Ala	Arg	Glu	Pro	Lys	Asn	Pro	Gln	
				245					250					255		
Thr	Val	Glu	Ala	Ser	Asp	Ser	Ser	Asn	Pro	Met	Val	Asp	Arg	Ser	Thr	
			260					265					270			
Ile	Gln	Arg	Asp	Ala	Gln	Leu	Ser	Tyr	Lys	Leu	Ala	Pro	Gln	Gly	Asn	
		275					280					285				
Asp	Trp	Leu	Asn	Ala	Asp	Ala	Lys	Ile	Tyr	Trp	Ser	Glu	Val	Arg	Ile	
	290					295					300					
Asn	Ala	Gln	Asn	Thr	Gly	Ser	Ser	Gly	Glu	Tyr	Arg	Glu	Gln	Ile	Thr	
305					310					315					320	
Lys	Gly	Ala	Arg	Leu	Glu	Asn	Arg	Ser	Thr	Leu	Phe	Ala	Asp	Ser	Phe	
				325					330					335		
Ala	Ser	His	Leu	Leu	Thr	Tyr	Gly	Gly	Glu	Tyr	Tyr	Arg	Gln	Glu	Gln	
			340					345					350			
His	Pro	Gly	Gly	Ala	Thr	Thr	Gly	Phe	Pro	Gln	Ala	Lys	Ile	Asp	Phe	
		355					360					365				

Ser Ser Gly Trp Leu Gln Asp Glu Ile Thr Leu Arg Asp Leu Pro Ile
370 375 380

Thr Leu Leu Gly Gly Thr Arg Tyr Asp Ser Tyr Arg Gly Ser Ser Asp
385 390 395 400

Gly Tyr Lys Asp Val Asp Ala Asp Lys Trp Ser Ser Arg Ala Gly Met
405 410 415

Thr Ile Asn Pro Thr Asn Trp Leu Met Leu Phe Gly Ser Tyr Ala Gln
420 425 430

Ala Phe Arg Ala Pro Thr Met Gly Glu Met Tyr Asn Asp Ser Lys His
435 440 445

Phe Ser Ile Gly Arg Phe Tyr Thr Asn Tyr Trp Val Pro Asn Pro Asn
450 455 460

Leu Arg Pro Glu Thr Asn Glu Thr Gln Glu Tyr Gly Phe Gly Leu Arg
465 470 475 480

Phe Asp Asp Leu Met Leu Ser Asn Asp Ala Leu Glu Phe Lys Ala Ser
485 490 495

Tyr Phe Asp Thr Lys Ala Lys Asp Tyr Ile Ser Thr Thr Val Asp Phe
500 505 510

Ala Ala Ala Thr Thr Met Ser Tyr Asn Val Pro Asn Ala Lys Ile Trp
515 520 525

Gly Trp Asp Val Met Thr Lys Tyr Thr Thr Asp Leu Phe Ser Leu Asp
530 535 540

Val Ala Tyr Asn Arg Thr Arg Gly Lys Asp Thr Asp Thr Gly Glu Tyr
545 550 555 560

Ile Ser Ser Ile Asn Pro Asp Thr Val Thr Ser Thr Leu Asn Ile Pro
565 570 575

Ile Ala His Ser Gly Phe Ser Val Gly Trp Val Gly Thr Phe Ala Asp
580 585 590

Arg Ser Thr His Ile Ser Ser Ser Tyr Ser Lys Gln Pro Gly Tyr Gly
595 600 605

Val Asn Asp Phe Tyr Val Ser Tyr Gln Gly Gln Gln Ala Leu Lys Gly
610 615 620

Met Thr Thr Thr Leu Val Leu Gly Asn Ala Phe Asp Lys Glu Tyr Trp
625 630 635 640

Ser Pro Gln Gly Ile Pro Gln Asp Gly Arg Asn Gly Lys Ile Phe Val
645 650 655

Ser Tyr Gln Trp
660

<210> 141
<211> 719
<212> PRT
<213> Escherichia coli

<400> 141
Met Arg Asp Glu Met Leu Tyr Asn Ile Pro Cys Arg Ile Tyr Ile Leu
1 5 10 15

Ser Thr Leu Ser Leu Cys Ile Ser Gly Ile Val Ser Thr Ala Thr Ala
20 25 30

Thr Ser Ser Glu Thr Lys Ile Ser Asn Glu Glu Thr Leu Val Val Thr
35 40 45

Thr Asn Arg Ser Ala Ser Asn Leu Trp Glu Ser Pro Ala Thr Ile Gln
50 55 60

Val Ile Asp Gln Gln Thr Leu Gln Asn Ser Thr Asn Ala Ser Ile Ala
65 70 75 80

Asp Asn Leu Gln Asp Ile Pro Gly Val Glu Ile Thr Asp Asn Ser Leu
85 90 95

Ala Gly Arg Lys Gln Ile Arg Ile Arg Gly Glu Ala Ser Ser Arg Val
100 105 110

Leu Ile Leu Ile Asp Gly Gln Glu Val Thr Tyr Gln Arg Ala Gly Asp
115 120 125

Asn Tyr Gly Val Gly Leu Leu Ile Asp Glu Ser Ala Leu Glu Arg Val
130 135 140

Glu Val Val Lys Gly Pro Tyr Ser Val Leu Tyr Gly Ser Gln Ala Ile
145 150 155 160

Gly Gly Ile Val Asn Phe Ile Thr Lys Lys Gly Gly Asp Lys Leu Ala
165 170 175

Ser Gly Val Val Lys Ala Val Tyr Asn Ser Ala Thr Ala Gly Trp Glu
180 185 190

Glu Ser Ile Ala Val Gln Gly Ser Ile Gly Gly Phe Asp Tyr Arg Ile
195 200 205

Asn Gly Ser Tyr Ser Asp Gln Gly Asn Arg Asp Thr Pro Asp Gly Arg
210 215 220

Leu Pro Asn Thr Asn Tyr Arg Asn Asn Ser Gln Gly Val Trp Leu Gly
225 230 235 240

Tyr Asn Ser Gly Asn His Arg Phe Gly Leu Ser Leu Asp Arg Tyr Arg
245 250 255

Leu Ala Thr Gln Thr Tyr Tyr Glu Asp Pro Asp Gly Ser Tyr Glu Ala
260 265 270

Phe Ser Val Lys Ile Pro Lys Leu Glu Arg Glu Lys Val Gly Val Phe
275 280 285

Tyr Asp Thr Asp Val Asp Gly Asp Tyr Leu Lys Lys Ile His Phe Asp
290 295 300

Ala Tyr Glu Gln Thr Ile Gln Arg Gln Phe Ala Asn Glu Val Lys Thr
305 310 315 320

Thr Gln Pro Val Pro Ser Pro Met Ile Gln Ala Leu Thr Val His Asn
325 330 335

Lys Thr Asp Thr His Asp Lys Gln Tyr Thr Gln Ala Val Thr Leu Gln

340	345	350														
Ser	His	Phe	Ser	Leu	Pro	Ala	Asn	Asn	Glu	Leu	Val	Thr	Gly	Ala	Gln	
	355						360					365				
Tyr	Lys	Gln	Asp	Arg	Val	Ser	Gln	Arg	Ser	Gly	Gly	Met	Thr	Ser	Ser	
	370					375					380					
Lys	Ser	Leu	Thr	Gly	Phe	Ile	Asn	Lys	Glu	Thr	Arg	Thr	Arg	Ser	Tyr	
385					390					395					400	
Tyr	Glu	Ser	Glu	Gln	Ser	Thr	Val	Ser	Leu	Phe	Ala	Gln	Asn	Asp	Trp	
				405					410					415		
Arg	Phe	Ala	Asp	His	Trp	Thr	Trp	Thr	Met	Gly	Val	Arg	Gln	Tyr	Trp	
			420					425					430			
Leu	Ser	Ser	Lys	Leu	Thr	Arg	Gly	Asp	Gly	Val	Ser	Tyr	Thr	Ala	Gly	
		435					440					445				
Ile	Ile	Ser	Asp	Thr	Ser	Leu	Ala	Arg	Glu	Ser	Ala	Ser	Asp	His	Glu	
	450					455					460					
Met	Val	Thr	Ser	Thr	Ser	Leu	Arg	Tyr	Ser	Gly	Phe	Asp	Asn	Leu	Glu	
465					470					475					480	
Leu	Arg	Ala	Ala	Phe	Ala	Gln	Gly	Tyr	Val	Phe	Pro	Thr	Leu	Ser	Gln	
				485					490					495		
Leu	Phe	Met	Gln	Thr	Ser	Ala	Gly	Gly	Ser	Val	Thr	Tyr	Gly	Asn	Pro	
			500					505					510			
Asp	Leu	Lys	Ala	Glu	His	Ser	Asn	Asn	Phe	Glu	Leu	Gly	Ala	Arg	Tyr	
		515					520					525				
Asn	Gly	Asn	Thr	Trp	Leu	Ile	Asp	Ser	Ala	Val	Tyr	Tyr	Ser	Glu	Ala	
	530					535					540					
Lys	Asp	Tyr	Ile	Ala	Ser	Leu	Ile	Cys	Asp	Gly	Ser	Ile	Val	Cys	Asn	
545					550					555					560	
Gly	Asn	Thr	Asn	Ser	Ser	Arg	Ser	Ser	Tyr	Tyr	Tyr	Tyr	Asp	Asn	Ile	

565					570					575					
Asp	Arg	Ala	Lys 580	Thr	Trp	Gly	Leu	Glu 585	Ile	Ser	Ala	Glu	Tyr 590	Asn	Gly
Trp	Val	Phe 595	Ser	Pro	Tyr	Ile	Ser 600	Gly	Asn	Leu	Ile	Arg 605	Arg	Gln	Tyr
Glu	Thr 610	Ser	Thr	Leu	Lys	Thr 615	Thr	Asn	Thr	Gly	Glu 620	Pro	Ala	Ile	Asn
Gly 625	Arg	Ile	Gly	Leu	Lys 630	His	Thr	Leu	Val	Met 635	Gly	Gln	Ala	Asn	Ile 640
Ile	Ser	Asp	Val	Phe 645	Ile	Arg	Ala	Ala	Ser 650	Ser	Ala	Lys	Asp	Asp 655	Ser
Asn	Gly	Thr	Glu 660	Thr	Asn	Val	Pro	Gly 665	Trp	Ala	Thr	Leu	Asn 670	Phe	Ala
Val	Asn	Thr 675	Glu	Phe	Gly	Asn	Glu 680	Asp	Gln	Ser	Arg	Ile 685	Asn	Leu	Ala
Leu	Asn 690	Asn	Leu	Thr	Asp	Lys 695	Arg	Tyr	Arg	Thr	Ala 700	His	Glu	Thr	Ile
Pro 705	Ala	Ala	Gly	Phe	Asn 710	Ala	Ala	Ile	Gly	Phe 715	Val	Trp	Asn	Phe	
<210> 142															
<211> 199															
<212> PRT															
<213> Escherichia coli															
<400> 142															
Met 1	Arg	Lys	Val	Cys 5	Ala	Val	Ile	Leu	Ser 10	Ala	Ala	Ile	Cys	Leu 15	Ser
Val	Ser	Gly	Ala 20	Pro	Ala	Trp	Ala	Ser 25	Glu	His	Gln	Ser	Thr 30	Leu	Ser
Ala	Gly	Tyr 35	Leu	His	Ala	Arg	Thr	Asn	Ala	Pro	Gly	Ser 45	Asp	Asn	Leu

Asn Gly Ile Asn Val Lys Tyr Arg Tyr Glu Phe Thr Asp Ala Leu Gly
50 55 60

Leu Ile Thr Ser Phe Ser Tyr Ala Asn Ala Glu Asp Glu Gln Lys Thr
65 70 75 80

His Tyr Ser Asp Thr Arg Trp His Glu Asp Ser Val Arg Asn Arg Trp
85 90 95

Phe Ser Val Met Ala Gly Pro Ser Val Arg Val Asn Glu Trp Phe Ser
100 105 110

Ala Tyr Ser Met Ala Gly Val Ala Tyr Ser Arg Val Ser Thr Phe Ser
115 120 125

Gly Asp Tyr Leu Arg Val Thr Asp Asn Lys Gly Lys Thr His Asp Val
130 135 140

Leu Thr Gly Ser Asp Asp Gly Arg His Ser Asn Thr Ser Leu Ala Trp
145 150 155 160

Gly Ala Gly Val Gln Phe Asn Pro Thr Glu Ser Val Thr Ile Asp Leu
165 170 175

Ala Tyr Glu Gly Ser Gly Ser Gly Asp Trp Arg Thr Asp Ala Phe Ile
180 185 190

Val Gly Ile Gly Tyr Arg Phe
195

<210> 143
<211> 456
<212> PRT
<213> Escherichia coli

<400> 143
Met Lys Lys Ser Thr Leu Ser Leu Ala Ile Gly Leu Leu Leu Ala Cys
1 5 10 15

Ser Thr Gly Met Ala Lys Thr Gln His Leu Thr Leu Glu Gln Arg Leu
20 25 30

Glu Ala Ala Glu Met Arg Ala Ala Lys Ala Glu Gly Gln Val Lys Gln
35 40 45

Leu Gln Thr Gln Gln Ala Ala Glu Ile Arg Glu Ile Lys Thr Ala Gln
50 55 60

Gly Asn Thr Pro Val Asn Gly Gln Ser Thr Thr Glu Ser Glu Lys Lys
65 70 75 80

Asn Ala Thr Pro Pro Asn Leu Leu Leu Ser Gly Tyr Gly Asp Leu Lys
85 90 95

Ile Tyr Gly Asp Val Glu Phe Asn Met Asp Ala Glu Ser Asn His Gly
100 105 110

Leu Leu Ala Met Thr Asn Ala Asp Val Asn Ser Asp Pro Thr Asn Glu
115 120 125

Trp Asn Leu Asn Gly Arg Ile Leu Leu Gly Phe Asp Gly Met Arg Lys
130 135 140

Leu Asp Asn Gly Tyr Phe Ala Gly Phe Ser Ala Gln Pro Leu Gly Asp
145 150 155 160

Met His Gly Ser Val Asn Ile Asp Asp Ala Val Phe Phe Phe Gly Lys
165 170 175

Glu Asn Asp Trp Lys Val Lys Val Gly Arg Phe Glu Ala Tyr Asp Met
180 185 190

Phe Pro Leu Asn Gln Asp Thr Phe Val Glu His Ser Gly Asn Thr Ala
195 200 205

Asn Asp Leu Tyr Asp Asp Gly Ser Gly Tyr Ile Tyr Met Met Lys Glu
210 215 220

Gly Arg Gly Arg Ser Asn Ala Gly Gly Asn Phe Leu Val Ser Lys Gln
225 230 235 240

Leu Asp Asn Trp Tyr Phe Glu Leu Asn Thr Leu Leu Glu Asp Gly Thr
245 250 255

Ser Leu Tyr Asn Asp Gly Asn Tyr His Gly Arg Asp Met Glu Gln Gln
260 265 270

Lys Asn Val Ala Tyr Leu Arg Pro Val Ile Ala Trp Ser Pro Thr Glu
275 280 285

Glu Phe Thr Val Ser Ala Ala Met Glu Ala Asn Val Val Asn Asn Ala
290 295 300

Tyr Gly Tyr Thr Asp Ser Lys Gly Asn Phe Val Asp Gln Ser Asp Arg
305 310 315 320

Thr Gly Tyr Gly Met Ser Met Thr Trp Asn Gly Leu Lys Thr Asp Pro
325 330 335

Glu Asn Gly Ile Val Val Asn Leu Asn Thr Ala Tyr Leu Asp Ala Asn
340 345 350

Asn Glu Lys Asp Phe Thr Ala Gly Ile Asn Ala Leu Trp Lys Arg Phe
355 360 365

Glu Leu Gly Tyr Ile Tyr Ala His Asn Lys Ile Asp Glu Phe Ser Gly
370 375 380

Val Val Cys Asp Asn Asp Cys Trp Ile Asp Asp Glu Gly Thr Tyr Asn
385 390 395 400

Ile His Thr Ile His Ala Ser Tyr Gln Phe Ala Asn Val Met Asp Met
405 410 415

Glu Asn Phe Asn Ile Tyr Leu Gly Thr Tyr Tyr Ser Ile Leu Asp Ser
420 425 430

Asp Gly Asp Lys Ile His Gly Asp Asp Ser Asp Asp Arg Tyr Gly Ala
435 440 445

Arg Val Arg Phe Lys Tyr Phe Phe
450 455

<210> 144

<211> 174

<212> PRT

<213> Escherichia coli

<400> 144

Met Asn Gly Lys Ala Phe Leu Ala Cys Val Leu Met Ser Val Val Leu

1	5	10	15
Thr Gly Cys Glu Thr Ala Lys Lys Ile Ser Gln Val Ile Arg Asn Pro	20	25	30
Asp Ile Gln Val Gly Lys Leu Met Asp Gln Ser Thr Glu Leu Thr Val	35	40	45
Thr Leu Leu Thr Glu Pro Asp Ser Asn Leu Thr Ala Asp Gly Glu Ala	50	55	60
Ala Pro Val Asp Val Gln Leu Val Tyr Leu Ser Asp Asp Ser Lys Phe	65	70	75
His Ala Ala Asp Tyr Asp Gln Val Ala Thr Thr Ala Leu Pro Asp Val	85	90	95
Leu Gly Lys Asn Tyr Ile Asp His Gln Asp Phe Asn Leu Leu Pro Asp	100	105	110
Thr Val Lys Thr Leu Pro Pro Ile Lys Leu Asp Glu Lys Thr Gly Tyr	115	120	125
Ile Gly Val Ile Ala Tyr Phe Ser Asp Asp Gln Ala Thr Glu Trp Lys	130	135	140
Gln Ile Glu Ser Val Glu Ser Ile Gly His His Tyr Arg Leu Leu Val	145	150	155
His Ile Arg Ala Ser Ala Ile Glu Met Lys Lys Glu Glu Asn	165	170	

<210> 145
 <211> 1144
 <212> PRT
 <213> Escherichia coli

<400> 145
Leu Thr Leu Ala Trp Ile Phe Leu Leu Val Trp Ile Trp Trp Gln Gly
1 5 10 15

Pro Lys Trp Thr Leu Tyr Glu Gln His Trp Leu Ala Pro Leu Ala Asn
20 25 30

Arg Trp Leu Ala Thr Ala Val Trp Gly Leu Ile Ala Leu Val Trp Leu
35 40 45

Thr Trp Arg Val Met Lys Arg Leu Gln Lys Leu Glu Lys Gln Gln Lys
50 55 60

Gln Gln Arg Glu Glu Glu Lys Asp Pro Leu Thr Val Glu Leu His Arg
65 70 75 80

Gln Gln Gln Tyr Leu Asp His Trp Leu Leu Arg Leu Arg Arg His Leu
85 90 95

Asp Asn Arg Arg Tyr Leu Trp Gln Leu Pro Trp Tyr Met Val Ile Gly
100 105 110

Pro Ala Gly Ser Gly Lys Ser Thr Leu Leu Arg Glu Gly Phe Pro Ser
115 120 125

Asp Ile Val Tyr Thr Pro Glu Ser Ile Arg Gly Val Glu Tyr His Pro
130 135 140

Leu Ile Thr Pro Arg Val Gly Asn Gln Ala Val Ile Phe Asp Val Asp
145 150 155 160

Gly Val Leu Thr Thr Pro Gly Gly Asp Asp Leu Leu Arg Arg Arg Leu
165 170 175

Arg Glu His Trp Leu Gly Trp Leu Met Gln Thr Arg Ala Arg Gln Pro
180 185 190

Leu Asn Gly Leu Ile Leu Thr Leu Asp Leu Pro Asp Leu Leu Thr Ala
195 200 205

Asp Lys Ser Arg Arg Glu Thr Leu Val Gln Asn Leu Arg Gln Gln Leu
210 215 220

Gln Glu Ile Arg Gln Ser Leu His Cys Arg Leu Pro Val Tyr Val Val
225 230 235 240

Leu Thr Arg Leu Asp Leu Leu Asn Gly Phe Ala Ala Leu Phe His Ser
245 250 255

Leu Asp Lys Lys Asp Arg Asp Ala Ile Leu Gly Val Thr Phe Thr Arg
260 265 270

Arg Ala His Glu Ser Asp Gly Trp Arg Ser Glu Leu Gly Ala Phe Trp
275 280 285

Gln Thr Trp Val Gln Gln Val Asn Leu Ala Leu Ser Asp Leu Val Leu
290 295 300

Ala Gln Thr Gly Ala Ala Pro Arg Ser Ala Val Phe Ser Phe Ser Arg
305 310 315 320

Gln Met Gln Gly Thr Gly Glu Ile Val Thr Ala Leu Leu Ala Ala Leu
325 330 335

Leu Asp Gly Glu Asn Met Asp Val Met Leu Arg Gly Val Trp Leu Thr
340 345 350

Ser Ser Leu Gln Arg Gly Gln Val Asp Asp Ile Phe Thr Gln Ser Ala
355 360 365

Ala Arg Gln Tyr Gly Leu Gly Asn Ser Ser Leu Ala Thr Trp Pro Leu
370 375 380

Val Glu Thr Thr Pro Tyr Phe Thr Arg Arg Leu Phe Pro Glu Val Leu
385 390 395 400

Leu Ala Glu Pro Asn Leu Ala Gly Glu Asn Ser Val Trp Leu Asn Ser
405 410 415

Ser Arg Arg Arg Leu Thr Ala Phe Ser Thr Cys Gly Ala Ala Leu Ala
420 425 430

Ala Leu Met Val Gly Ser Trp His His Tyr Tyr Asn Gln Asn Trp Gln
435 440 445

Ser Gly Val Asn Val Leu Ala Gln Ala Lys Ala Phe Met Asp Val Pro
450 455 460

Pro Pro Gln Gly Thr Asp Glu Phe Gly Asn Leu Gln Leu Pro Leu Leu
465 470 475 480

Asn Pro Val Arg Asp Ala Thr Leu Ala Tyr Gly Asp Tyr Arg Asp His

485										490					495				
Gly	Phe	Leu	Ala	Asp	Met	Gly	Leu	Tyr	Gln	Gly	Ala	Arg	Val	Gly	Pro				
			500					505					510						
Tyr	Val	Glu	Gln	Thr	Tyr	Ile	Gln	Leu	Leu	Glu	Gln	Arg	Tyr	Leu	Pro				
		515					520					525							
Ser	Leu	Met	Asn	Gly	Leu	Ile	Arg	Asp	Leu	Asn	Ile	Ala	Pro	Pro	Glu				
	530					535					540								
Ser	Glu	Glu	Lys	Leu	Ala	Val	Leu	Arg	Val	Val	Arg	Met	Met	Glu	Asp				
545					550					555					560				
Lys	Ser	Gly	Arg	Asn	Asn	Glu	Ala	Val	Lys	Gln	Tyr	Met	Ala	Arg	Arg				
				565					570					575					
Trp	Ser	Asn	Glu	Phe	His	Gly	Gln	Arg	Asp	Ile	Gln	Ala	Gln	Leu	Met				
			580					585					590						
Val	His	Leu	Asp	Tyr	Ala	Leu	Glu	His	Thr	Asp	Trp	His	Ala	Gln	Arg				
		595					600					605							
Gln	Ser	Ser	Asp	Ser	Asp	Ala	Val	Ser	Arg	Trp	Thr	Pro	Tyr	Asp	Lys				
	610					615					620								
Pro	Ile	Ile	Asn	Ala	Gln	Gln	Glu	Leu	Ser	Lys	Leu	Pro	Ile	Tyr	Gln				
625					630					635					640				
Arg	Val	Tyr	Gln	Thr	Leu	Arg	Thr	Lys	Ala	Leu	Ser	Val	Leu	Pro	Ala				
				645					650					655					
Asp	Leu	Asn	Leu	Arg	Asp	Gln	Val	Gly	Pro	Thr	Phe	Asp	Asn	Val	Phe				
			660					665					670						
Val	Ala	Gly	Asn	Asp	Glu	Lys	Leu	Val	Ile	Pro	Gln	Phe	Leu	Thr	Arg				
		675					680					685							
Tyr	Gly	Leu	Gln	Ser	Tyr	Phe	Val	Lys	Gln	Arg	Glu	Gly	Leu	Val	Glu				
	690					695					700								
Leu	Thr	Ala	Leu	Asp	Ser	Trp	Val	Leu	Asn	Leu	Thr	Gln	Ser	Val	Ala				
705					710					715					720				

Tyr Ser Glu Ala Asp Arg Glu Glu Ile Gln Arg His Ile Thr Glu Gln
725 730 735

Tyr Ile Ser Asp Tyr Thr Ala Thr Trp Arg Ala Gly Met Asp Asn Leu
740 745 750

Asn Val Arg Asp Tyr Glu Ala Met Ser Ala Leu Thr Asp Ala Leu Glu
755 760 765

Gln Ile Ile Ser Gly Asp Gln Pro Phe Gln Arg Ala Leu Thr Ala Leu
770 775 780

Arg Asp Asn Thr His Ala Leu Thr Leu Ser Gly Lys Leu Asp Asp Lys
785 790 795 800

Ala Arg Glu Ala Ala Ile Asn Glu Met Asp Tyr Arg Leu Leu Ser Arg
805 810 815

Leu Gly His Glu Phe Ala Pro Glu Asn Ser Ala Leu Glu Glu Gln Lys
820 825 830

Asp Lys Ala Ser Thr Leu Gln Ala Val Tyr Gln Gln Leu Thr Glu Leu
835 840 845

His Arg Tyr Leu Leu Ala Ile Gln Asn Ser Pro Val Pro Gly Lys Ser
850 855 860

Ala Leu Lys Ala Val Gln Leu Arg Leu Asp Gln Asn Ser Ser Asp Pro
865 870 875 880

Ile Phe Ala Thr Arg Gln Met Ala Lys Thr Leu Pro Ala Pro Leu Asn
885 890 895

Arg Trp Val Gly Lys Leu Ala Asp Gln Ala Trp His Val Val Met Val
900 905 910

Glu Ala Val Arg Tyr Met Glu Val Asp Trp Arg Asp Asn Val Val Lys
915 920 925

Pro Phe Asn Glu Gln Leu Ala Asp Asn Tyr Pro Phe Asn Pro Arg Ala
930 935 940

Thr Gln Asp Ala Ser Leu Asp Ser Phe Glu Arg Phe Phe Lys Pro Asp
945 950 955 960

Gly Ile Leu Asp Asn Phe Tyr Lys Asn Asn Leu Arg Leu Phe Leu Glu
965 970 975

Asn Asp Leu Thr Phe Gly Asp Asp Gly Arg Val Leu Ile Arg Glu Asp
980 985 990

Ile Arg Gln Gln Leu Asp Thr Ala Gln Lys Ile Arg Asp Ile Phe Phe
995 1000 1005

Ser Gln Gln Asn Gly Leu Gly Ala Gln Phe Ala Val Glu Thr Val
1010 1015 1020

Ser Leu Ser Gly Asn Lys Arg Arg Ser Val Leu Asn Leu Asp Gly
1025 1030 1035

Gln Leu Val Asp Tyr Ser Gln Gly Arg Asn Tyr Thr Ala His Leu
1040 1045 1050

Val Trp Pro Asn Asn Met Arg Glu Gly Asn Glu Ser Lys Leu Thr
1055 1060 1065

Leu Ile Gly Thr Ser Gly Arg Ala Pro Arg Ser Ile Ala Phe Ser
1070 1075 1080

Gly Pro Trp Ala Gln Phe Arg Leu Phe Gly Ala Gly Gln Leu Thr
1085 1090 1095

Asn Val Thr Ser Asp Thr Phe Asn Val Arg Phe Asn Val Asp Gly
1100 1105 1110

Gly Ala Met Val Tyr Gln Val His Val Asp Thr Glu Asp Asn Pro
1115 1120 1125

Phe Thr Gly Gly Leu Phe Ser Leu Phe Arg Leu Pro Asp Thr Leu
1130 1135 1140

Tyr

<210> 146
 <211> 489
 <212> DNA
 <213> Escherichia coli

<400> 146
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 atcccgaccg acaataacac cggcaaactg accggtaccc gtactcacia gcctttttacg 180
 ttaccaaaag aaatcgatgc gtccagcccg tatctctaca aagctgtgac caccggacag 240
 accctgaaaa cggcagaatt taagttttac cgcatacaac atgccggtca ggaagtggag 300
 tacttcaaca tcacgcttga taacgtcaag ctggtcagag tcgctccgct tatgcacgac 360
 atcaaggatc cttccagaga gaagcataac cacctggaac gtattgagtt ccgctacgag 420
 aaaatcacct ggacttacia agacggcaac atcattcatt ccgactcgtg gaatgagcgt 480
 ccttccgcc 489

<210> 147
 <211> 1650
 <212> DNA
 <213> Escherichia coli

<400> 147
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 tggtcagtgt ttatcagtcc gtctggcggtg ctgagatggg ccggtgcggc ggctatcggt 120
 ctggcggttg ccgcggttgt gatttatcgg cgcaggcagg cgtggacgga gatgaccggc 180
 gatgccgggt tgtcatcgct gccgccgga acctaccgac agccggtagt gctgggtctgt 240
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 cgcccggcgt gggcatcgca gcttgccgtg gcgtatacca tcatgcccg catabaccgg 420
 gatgtggcgg ttctggccgg acggctgcga cggttcgccc acagtatggc gacgggtgcgt 480
 cgtcgggcag gcgtaaacgt cccctggctt ctctggagcg ggctgtccgg ctcgccgttg 540
 ccggaagag cgagttcacc gtgggtttatc tgtaccggcg gcgaagttca ggtagcaaca 600
 tccacagaga ccaccatgcc cgcgcagtgg attgcacaat ccggcgatca ggagcgcagt 660
 cagcgactct gttacctgct gaaagctgaa agcctgatgc agtggctgaa tcttaatgtg 720
 ctgacggcac tgaacggccc ggaggcgaaa tgtccaccac tggcgatgac cgtggggctg 780

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gaatttatca	ccaaagcccg	tcacctgtcg	gtgctgaaag	acgatgcgac	catgctcgat	1140
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accagcgaca	tcccggccac	ctgttttgcc	gtacagggac	tgggcgagag	ccagcctgcg	1560
gcgaccaacg	acacgccaca	gggccgggca	gtcaaccggc	gtgtcgaaat	cagtcttggt	1620
ccgcgttctg	acgcctgtca	ggacgtgaaa				1650

<210> 148
 <211> 582
 <212> DNA
 <213> Escherichia coli

<400> 148	
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ctcatcacgc	tgctgcgcc ggggatttca cccgcagtca attcccagca actgttgacc 180
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ctggctgacg	tgatgctcag ccaactggccg attagcgctt ggcaaccgca acttcccaca 420
ggctggacgc	ttcgcgacaa cggcgacaaa cgcgagctgc gtaacgccag cggcaaactg 480
gtcacggaaa	tcacctatct gaatcgccag ggaaaacgcg tgccaatcag cattgagcag 540
catgtcttta	aataccacat caccattcaa tacttaggtg ac 582

<210> 149
 <211> 387
 <212> DNA
 <213> Escherichia coli

<400> 149
 atgaaacggt atataaaatg gtttgccatc acaattttta tcagtatggt gagtgcctgt 60
 gtccgtacgg cccagtgca acagataagc accactgtca gtgtgggtca tactcaggag 120
 cagggttaaaa atgccatttt gaaagcaggt gcgcagcgca agtggattat gacgcaagtg 180
 tcccctggag ttattaaagc tcgctatcaa acacgaaatc acgttgcaga ggttcgtatt 240
 acatatacag ctacctacta taacatcaaa tatgacagta gcctgaatct gcaggcttct 300
 gatggaaaaa ttcataaaaa ctataaccgc tgggtgcgta acctggataa agatatacag 360
 gttaacttat ctacaggagc aacgtta 387

<210> 150
 <211> 1245
 <212> DNA
 <213> Escherichia coli

<400> 150
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 gagttaactt cggcacaatc ccgcatagag caggcaagct ctgcacattg gccagttgtc 180
 acagctacag gaagtaaact cttttcacia agtcaccgtt attcctacga ttatgacact 240
 gaagatattt tacccggtat tcgtggtgaa gtgaatatat ttgcttcagg ggctattgag 300
 gcggatgtgc gtcggagtga gtcagaagcc gaatattatc attataaaat ggaagaaaca 360
 aaagaggaaa caattcactc ttttgtttca ttatatcttg atgcactcag ggaaaaacaa 420
 tccattgcgg tacttgaaca gagcctttcc cggcataacg caattcttaa tgacctgaat 480
 accatcagta ttcatgatac cgggcgggag tctgagcttg ttcaggccga agccagaagg 540
 ttgatggttc ggcagcagat aaattctagg agcagagtac ttaaaaccac gctgggaaaa 600
 ctgtccactt ggacaaaaaa tccggtaacc gaagctgata ttgaaaatcc tttttctagg 660
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caggaacagg cttcagccag agttgtggac ttttatcgtc ttcagtttca ggtggcaaga	1080
aaaacactga ttgaattact gaatgctgaa aacgaactgt acagtgtcgg actctcccgg	1140
gttcagacgg aggatcagat gctccacggg atgctggatt atctgtattc ccagggaatg	1200
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<210> 151
 <211> 603
 <212> DNA
 <213> Escherichia coli

<400> 151	
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cggacgatta aagatctgcc gcagccgctg cgatctcagg gtcagatggt gatcgcccgc	180
gaccaggggt tattgtggga tcaaacctca ccgttcccca tgcagctatt gctggatgat	240
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ccgcagatgt tccagtttaa ccacctgctg cgcgcgctgt tccaggccga tcgcaaagtg	360
ctggaacaaa acttccgctg cgaatttgct gacaaaggcg aaggccgctg gacgctgcgc	420
ctgacgccga ccaccacgcc gctggataaa attttcaaca ccatcgatct cgccgggaaa	480
acctatctgg agagcattca acttaatgat aaacagggcg atcgaccga tattgctctt	540
acccaacatc aactgacgcc agcgcaactg accgatgacg aacaccaacg ttttgccgcc	600
cag	603

<210> 152
 <211> 2295
 <212> DNA
 <213> Escherichia coli

<400> 152	
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tctgcaccag cattcgctac tgatagcacg gtatcaactg atccggttac gctgaataca	120
gagaagacga ctctggatca agatgttggtt attaacgggtg ataacaagat tacagccgta	180

acaattgaaa	cgtcagattc	agataaagac	cttaatgtta	cttttggcgg	tcacgatatt	240
accgccgcat	caacggtaaa	ccaagatttc	gttgaagggtg	taaaagttag	tggtaacaaa	300
aatgtttgtga	ttaatgctac	agactccacc	atcacagctc	aagggtgaagg	cacctatgtc	360
cggactgcaa	tggtcattga	ttcaactggc	gatgtttgttg	ttaatggcgg	taatttcggt	420
gcaaaaaatg	aaaaaggtag	tgcgacaggg	atatctcttg	aagcgaccac	gggaaataat	480
ttaacgctca	atggtacaac	cataaatgct	caaggtaata	agagttacag	caacggctct	540
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aacatcaccc	ttgctgactc	aaatattatt	aatggcgggga	ttgaaacaat	agttactgcc	660
gggaataaga	cgggaattca	tacagtcaac	ctgaatatta	aggatggctc	agtaattggg	720
gcggctaata	ataaacaac	aatttatgcc	tctgcttcgg	cacaaggcgc	aggttcagca	780
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<210> 153
 <211> 1980
 <212> DNA
 <213> *Escherichia coli*

<400> 153						
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<210> 154
 <211> 2157
 <212> DNA
 <213> *Escherichia coli*

<400> 154	
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aacgaagaga	cgctcgtcgt gaccacgaat cgttcggcaa gcaacctttg ggaaagcccg 180
gcgactatac	aggttattga ccaacaaaca ttgcagaact ccaccaatgc ctccatagcc 240
gataatttgc	aggacatccc cggagtagag ataacagaca actccttggc aggccgtaaa 300
caaatccgca	ttcgtggcga agcatcctcc cgtgttttaa ttctcattga tggtcaggag 360
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gatcagtc	ggattaac	agcactcaat	aacctgacag	acaaacgcta	ccgtacagca	2100
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<211> 600

<212> DNA

<213> Escherichia coli

<400> 155

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<211> 1368

<212> DNA

<213> Escherichia coli

<400> 156

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 <211> 522
 <212> DNA
 <213> Escherichia coli

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 <213> Escherichia coli

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<210> 159

<211> 725

<212> PRT

<213> Escherichia coli

<400> 159

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35 40 45

Pro Gly Val Ser Val Ile Thr Ser Glu Asp Ile Lys Lys Thr Pro Pro
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Val Asn Asp Leu Ser Asp Ile Ile Arg Lys Met Pro Gly Val Asn Leu
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Thr Gly Asn Ser Ala Ser Gly Thr Arg Gly Asn Asn Arg Gln Ile Asp
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Asp Thr Arg Gly Asp Thr Asn Trp Val Pro Pro Glu Gln Val Glu Arg
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145 150 155 160

Ala Gly Gly Val Val Asn Ile Ile Thr Lys Arg Pro Thr Asn Asp Trp
165 170 175

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180 185 190

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195 200 205

Asp Ala Leu Thr Thr Arg Leu Tyr Gly Asn Leu Asn Lys Thr Asp Ala

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Leu Val Gly Thr Asn Phe Asn Tyr Asp Ile Asn Lys Asn Leu Arg Leu
675 680 685

Asn Val Gly Val Ser Asn Ile Leu Asn Lys Gln Ile Phe Arg Ser Ser
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<210> 160
<211> 2175
<212> DNA
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